ADDITIONAL

Service Manual

PIONEER

ORDER NO.
HRT-178-0

PORTABLE STEREO FM/SW/MW/LW RADIO CASSETTE RECORDER

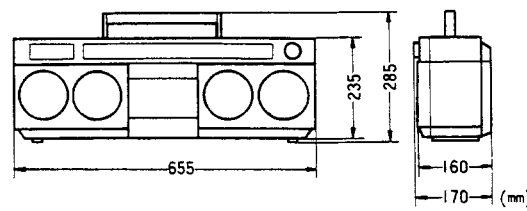
SK-909L HT,HB

Subject: The SK-909L/HT, HB manual is designed to be used together with Model SK-900/KC Service Manual (HRT-177). Refer to these service manuals for parts and adjustment, etc. which are not given in the manuals.

SPECIFICATIONS

Max. rated output Power	13W + 13W/8Ω, 5% THD.
Max. music power	40W (total music power)
Speaker	Air-tight cabinet, 12cm (5 in.) mechanical 2 way system with passive radiator
Recording/playback frequency characteristics	50~14,000Hz (±3dB) (Normal tape) 50~15,000Hz (±3dB) (CrO_2 tape) 50~16,000Hz (±3dB) (Metal tape)
Recording/playback S/N ratio	59dB (Dolby NR on, Normal tape) 51dB (Dolby NR off, Normal tape)
Input	AUX, PHONO, MIC (also functions as MIX MIC), EXT. ANT
Output	LINE OUT, PHONES
Subfunctions	Dolby NR, Tape selector (Metal/CrO_2-Normal), Auto/manual recording, Skip search, Music repeat, One side repeat, Automatic editor, Timer standby mechanism, 6-band graphic equalizer, FM muting, Stereo microphone mixing
Indicators	Red LEDs: CrO_2, METAL, AUTO EDITOR, REC, PHONO/AUX, AM, FM, FM MODE, STEREO, OPERATION, SKIP SEARCH (8) Green LEDs: DOLBY NR, PLAY, REW, FF, PAUSE, ONE SIDE REPEAT, MUSIC REPEAT, TAPE Others: ACCESS TUNING (two red, one green), LEVEL (stereo meter)
Frequency range	FM: 88~104MHz SW: 6~18MHz MW: 525~1,605kHz LW: 150~280kHz
Power source	220/240V AC, 50/60Hz; ten size "D" flashlight batteries (1.5V); EXT 15V DC (12~15V)
Dimensions (W×H×D)	655×235×160mm (25-3/4×9-1/4×6-1/4 in.)
Weight	9.9kg (21.8 lbs., without batteries)

Note: Specifications and design are subject to change without notice.



PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

TRAPPING ADJUSTMENT

- **Connection Diagram**

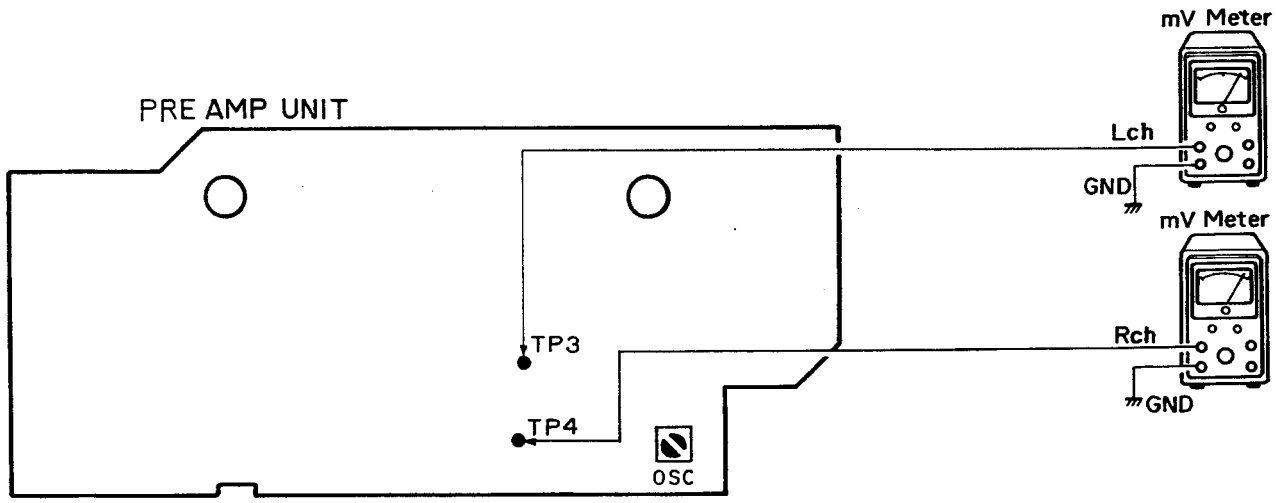


Fig. 1

- **To Adjust**

1. Put the unit into the record mode.
2. Turn the BFC switch to position "2." Adjust OSC so that the millivoltmeters show the smallest deflection.

AM IF ADJUSTMENT

- **Connection Diagram**

Generator Scope

Sweep center frequency 468kHz
Input gain 0.3Vp-p/cm

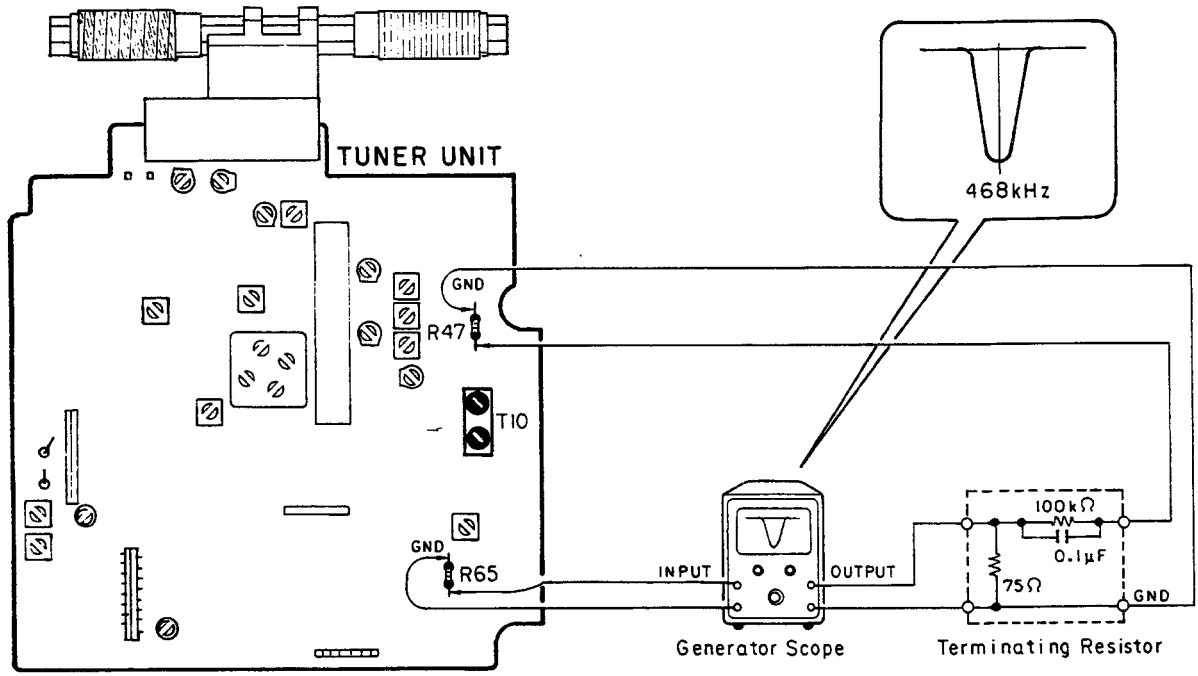


Fig. 2

- **To Adjust**

1. Apply the minimum output signal enabling the Generator Scope's U curve to be checked from the Generator scope and adjust T10 so that the amplitude of the curve is brought to its maximum and the symmetry is made optimum.

MW,LW TRACKING ADJUSTMENT

• Connection Diagram

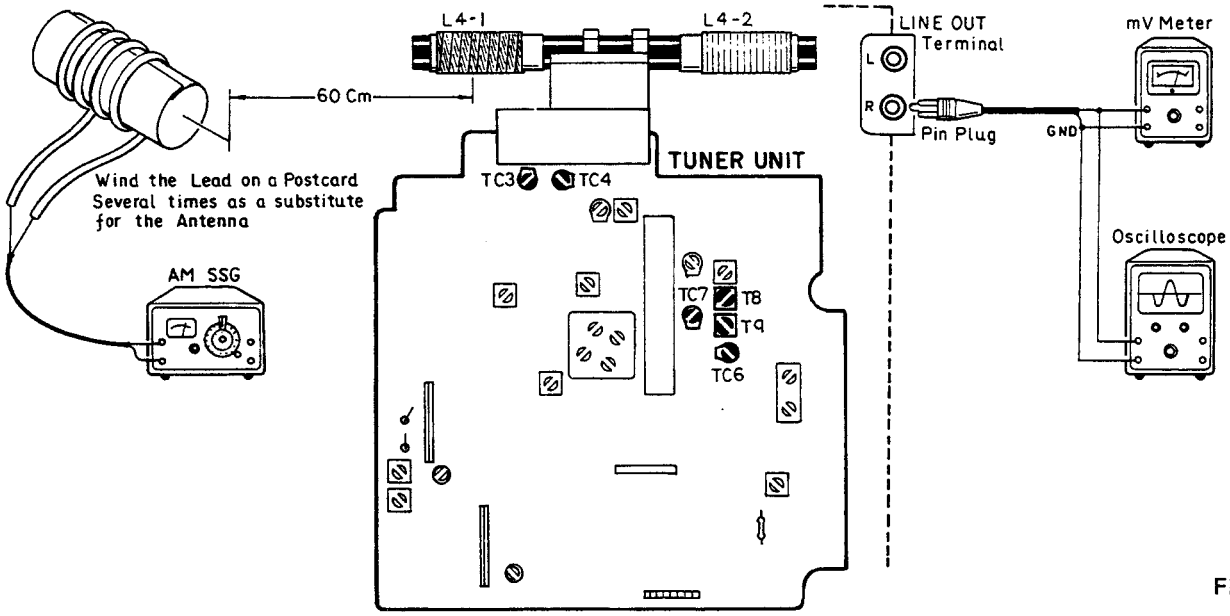


Fig. 3

• To Adjust (MW)

Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 515 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T8	515 kHz can be received.
2. 1,650 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Minimum (turn the tuning knob Clockwise until high end.)	TC7	1,650 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 515 ~ 1,650 kHz are received.			
4. 600 kHz (400 Hz. 30% modulation) output level 40 ~ 50dB/m.	Tuned to 600 kHz.	L4-2 (MW coil of bar antenna)	Maximum output.
5. 1,450 kHz (400 Hz. 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 1,450 kHz.	TC4	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting L4-2 (MW coil of bar antenna), melt electro wax soldering iron and fix it in position.

• To Adjust (LW)

Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 140 kHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Maximum (turn the tuning knob Counterclockwise until low end.)	T9	140 kHz can be received.
2. 300 kHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Minimum (turn the tuning knob Clockwise until high end.)	TC6	300 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 140 ~ 300 kHz are received.			
4. 150 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 150 kHz.	L4-1 (LW coil of bar antenna)	Maximum output.
5. 280 kHz (400 Hz, 30% molduation) output level 40 ~ 50 dB/m.	Tuned to 280 kHz.	TC3	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting L4-1 (LW coil of bar antenna), melt electro wax with soldering iron and fix it in position.

SW TRACKING ADJUSTMENT

- **Connection Diagram**

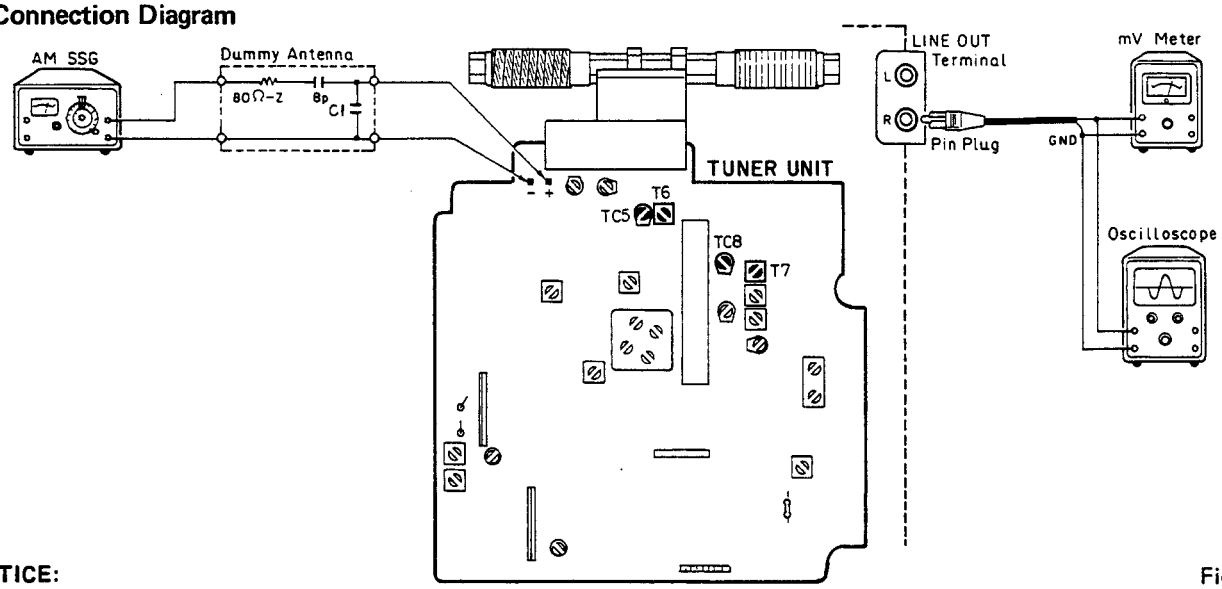


Fig. 4

NOTICE:

Select C1 so that total capacity of 80 pF is attained from the direction of the receiver jack.

Z: Output impedance of the SSG.

- **To Adjust**

	Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1.	5.8 MHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T7	5.8 MHz can be received.
2.	18.5 MHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Minimum (turn the tuning knob clockwise until high end.)	TC8	18.5 MHz can be received.
3.	Repeat (1) and (2) alternately and adjust so that 5.8 ~ 18.5 MHz are received.			
4.	7 MHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 7 MHz.	T6	Maximum output.
5.	17 MHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 17 MHz.	TC5	Maximum output.
6.	Repeat (4) and (5) alternately and confirm that they are as specified.			

FM IF ADJUSTMENT

- **Connection Diagram**

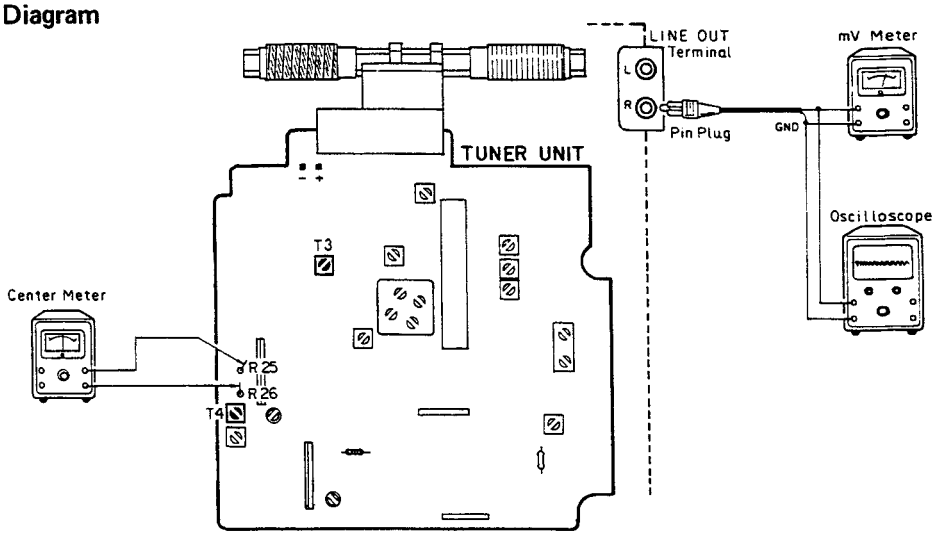


Fig. 5

- **To Adjust**

1. Adjust T3 so that noise level is highest at white noise.
2. Adjust T4 so that the center meter points to the center.

FM TRACKING ADJUSTMENT

- **Connection Diagram**

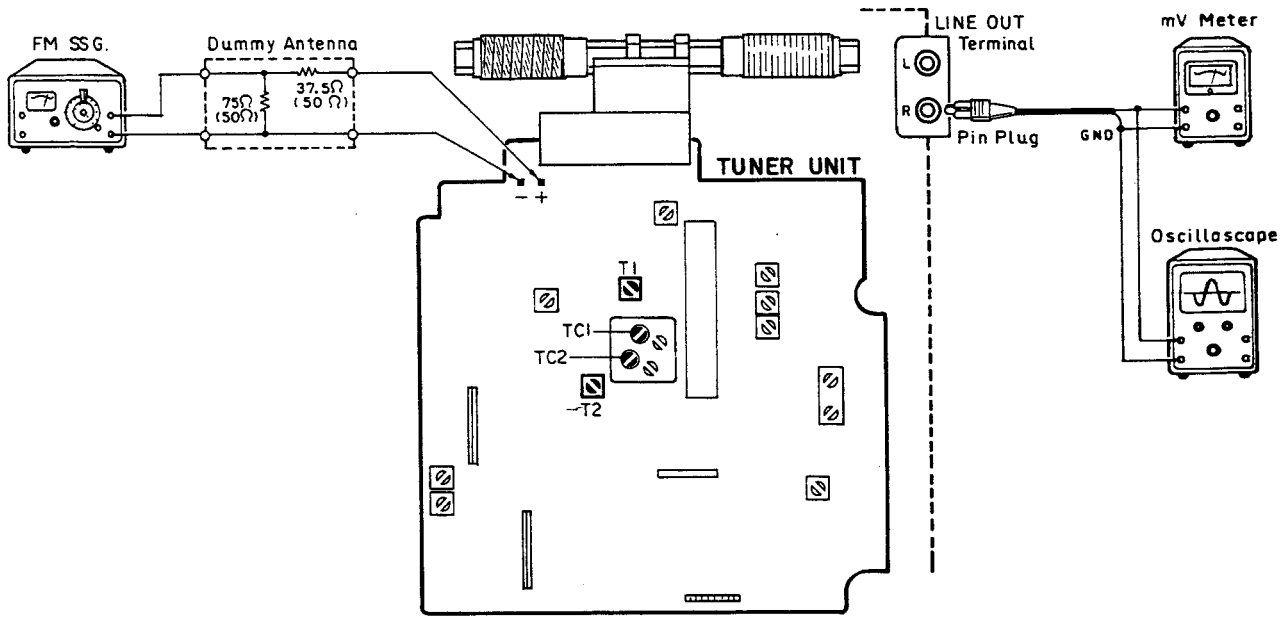


Fig. 6

- **To Adjust**

Frequency of FM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 87.5 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Maximum (turn the tuning knob counterclockwise until low end.)	T2	87.5 MHz can be received.
2. 106 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Minimum (turn the tuning knob clockwise until high end.)	TC2	106 MHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 87.5 ~ 106 MHz are received.			
4. 90 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 90 MHz.	T1	Maximum output.
5. 104 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 104 MHz.	TC1	Maximum output.
6. Repeat (4) and (5) alternately and adjust until tracking error disappears.			

FM IF FINAL ADJUSTMENT

- **Connection Diagram**

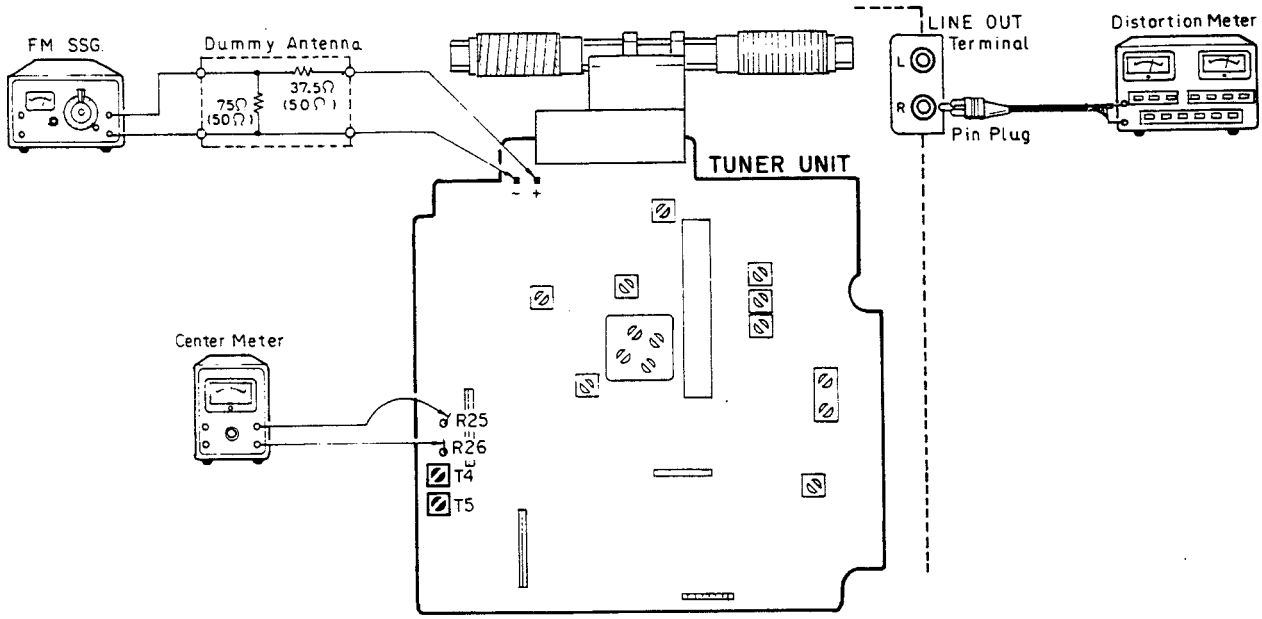


Fig. 7

- **To Adjust**

1. Adjust T4 so that the center meter points to the center when there is no signal.
2. Apply a signal of 82 MHz, 66 dB(μV) from the FM SSG and tune the tuner to the signal.
3. Adjust T5 so that distortion becomes minimum.
4. Turning T5 changes the center meter reading, and turning T4 changes the distortion value. Repeat items 1 and 3 to obtain the optimum result.

FM MPX ADJUSTMENT

• Connection Diagram

Stereo Modulator

Modulation frequency 1kHz
Modulation ratio 100%
Pilot signal . . . . . 7.5kHz deviation
Main signal . . . . . 67.5kHz deviation

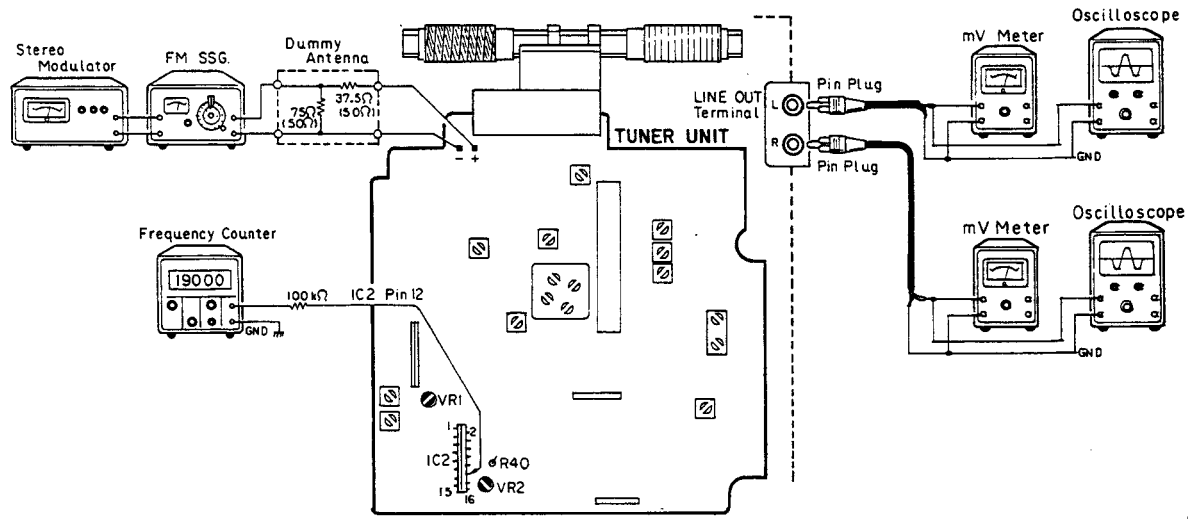
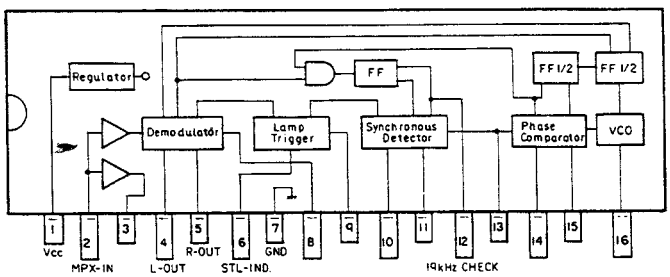


Fig. 8

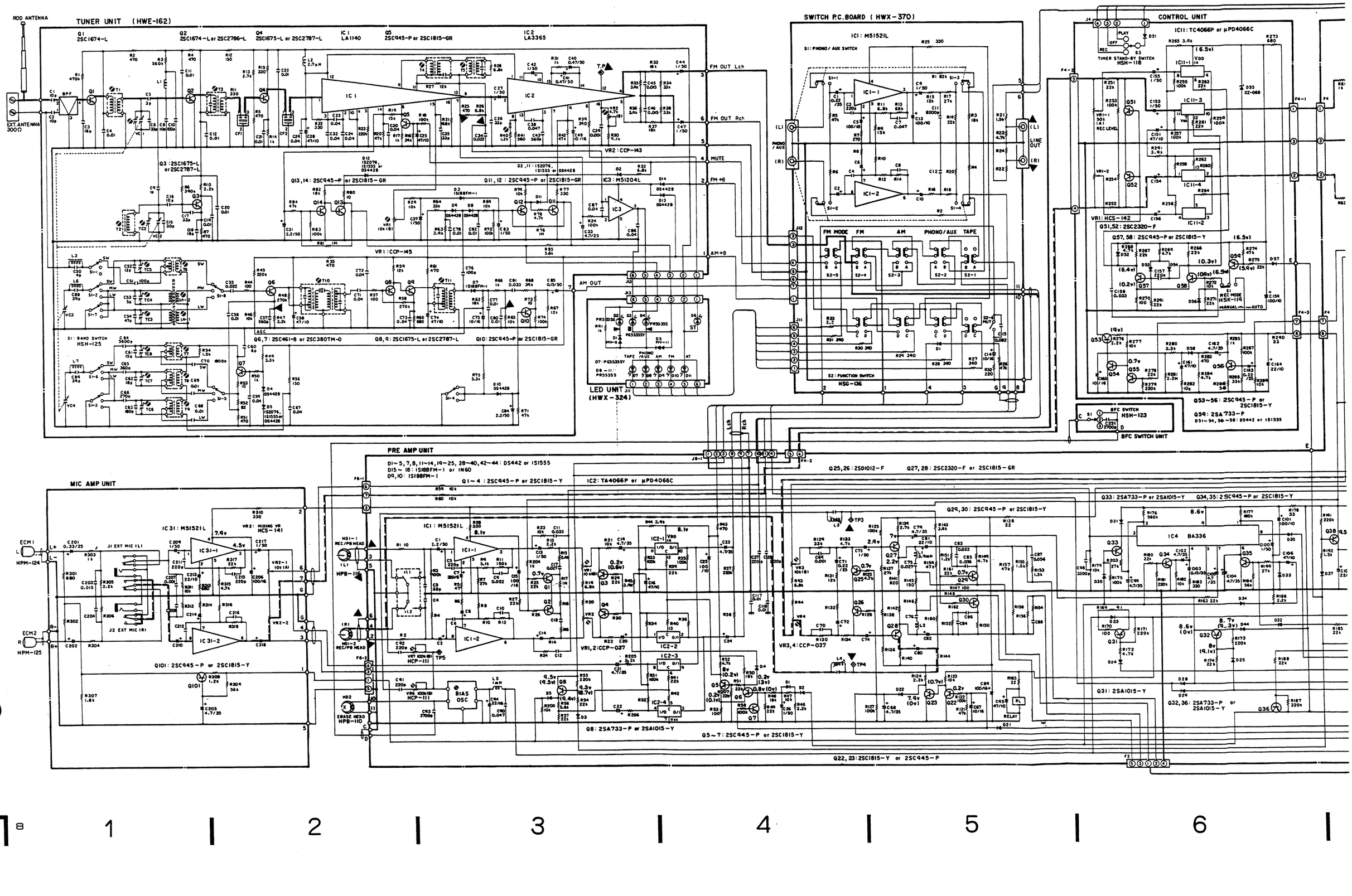
• To Adjust

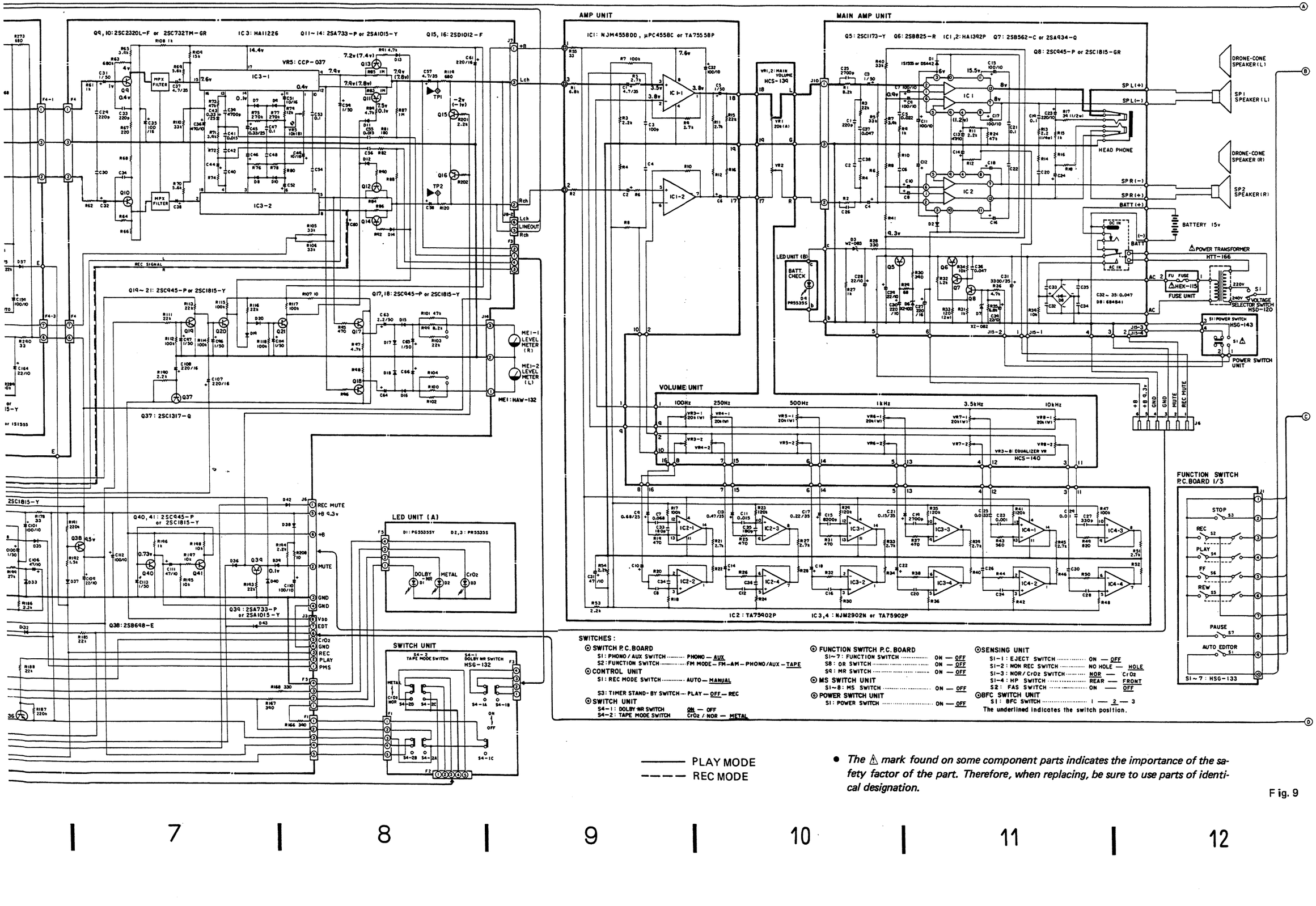
1. Apply a signal of 82 MHz, 10dB from the FM SSG, and tune the tuner to the signal.
2. Set the output of the FM SSG to 60 dB, and turn the modulation off.
3. Adjust VR2 so that the counter indicates within ±20 Hz of 19 kHz.
4. Check the separation. If the separation is not less than 25dB cut the body of R40.
5. Set the output of the FM SSG to 26 dB. Then adjust VR1 so that the tuning indicator (green) lights.

LA3365



SCHEMATIC CIRCUIT DIAGRAM





- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Fig. 9

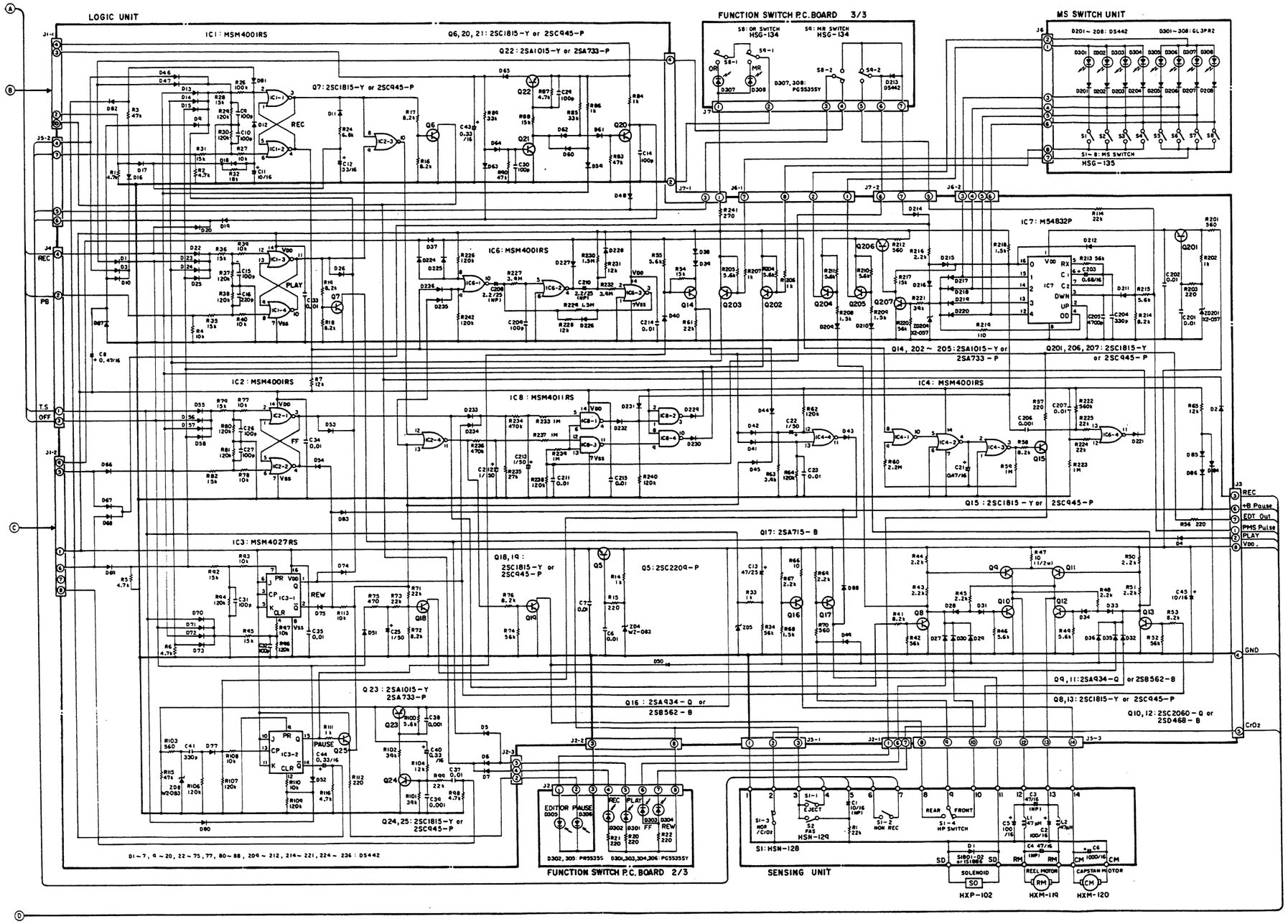

LOGIC UNIT
IC1: MSM4001RS
Q6, 20, 21: 2SC1815-Y or 2SC945-P
Q22: 2SA1015-Y or 2SA733-P
Q7: 2SC1815-Y or 2SC945-P
FUNCTION SWITCH P.C.BOARD 3/3
S8: OR SWITCH HSG-134
S9: MB SWITCH HSG-134
MS SWITCH UNIT
S1~8: MS SWITCH HSG-135
IC7: M54832P
IC6: MSM4001RS
IC2: MSM4001RS
IC8: MSM4011RS
IC4: MSM4001RS
IC3: MSM4027RS
Q14, 202~205: 2SA1015-Y or 2SA733-P
Q201, 206, 207: 2SC1815-Y or 2SC945-P
Q15: 2SC1815-Y or 2SC945-P
Q17: 2SA715-B
Q18, 19: 2SC1815-Y or 2SC945-P
Q5: 2SC2204-P
Q23: 2SA1015-Y 2SA733-P
Q16: 2SA934-Q or 2SB562-B
Q24, 25: 2SC1815-Y or 2SC945-P
Q9, 11: 2SA934-Q or 2SB562-B
Q8, 13: 2SC1815-Y or 2SC945-P
Q10, 12: 2SC2060-Q or 2SD468-B
FUNCTION SWITCH P.C.BOARD 2/3
SENSING UNIT
S1: HSN-128
HSN-129
HXP-102
HXM-119
HXM-120
SOLENOID
REEL MOTOR
CAPSTAN MOTOR
REC
+B Pause
EDT Out
PMS Pulse
PLAY
VDD.
GND
CrO2

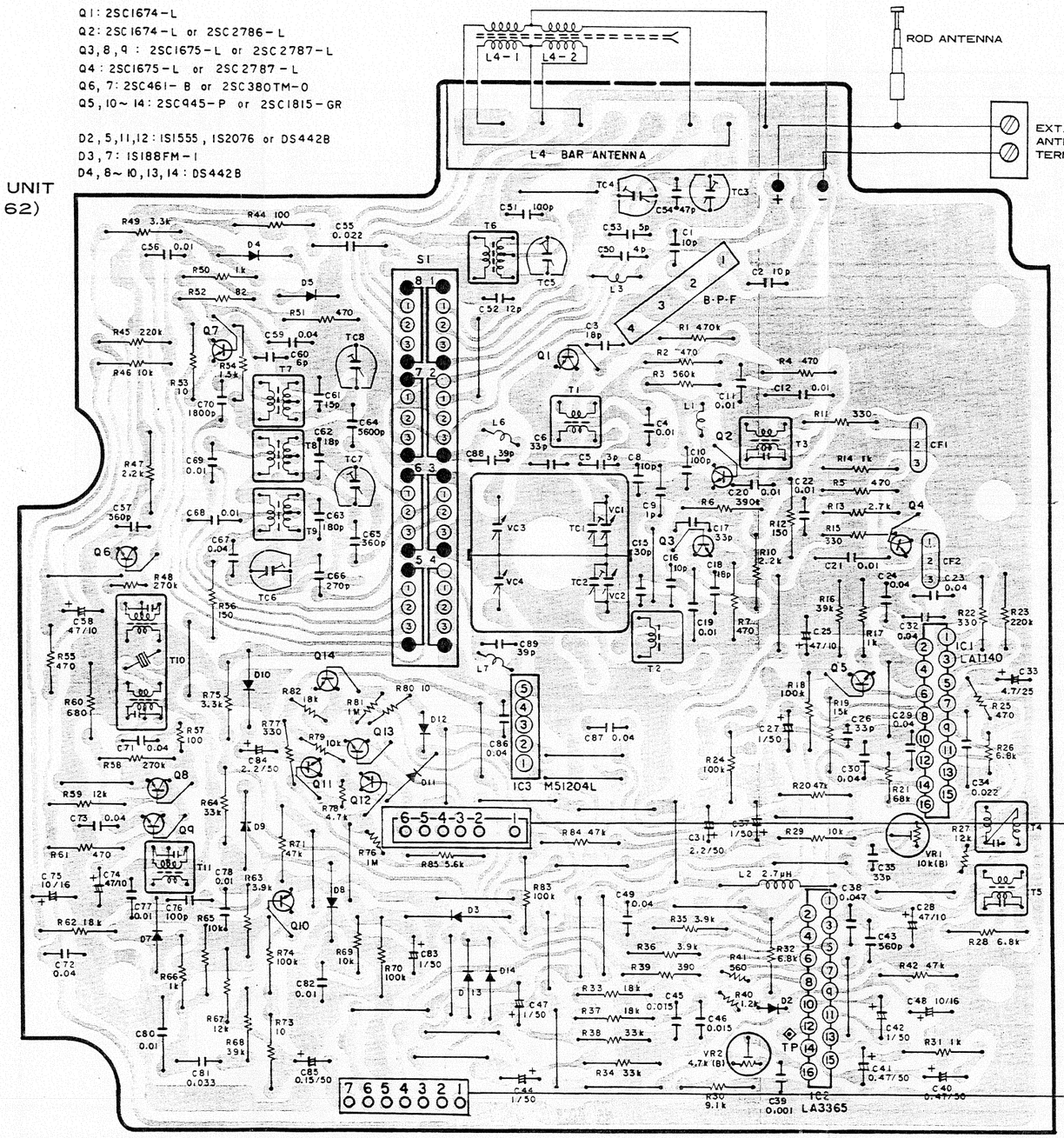
Fig. 10

CONNECTION DIAGRAM

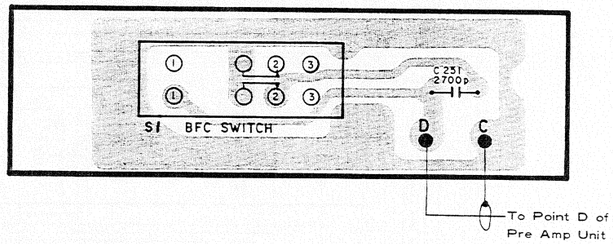
Q1: 2SC1674-L
Q2: 2SC1674-L or 2SC2786-L
Q3,8,9: 2SC1675-L or 2SC2787-L
Q4: 2SC1675-L or 2SC2787-L
Q6, 7: 2SC461-B or 2SC380TM-O
Q5, 10~14: 2SC945-P or 2SC1815-GR

D2, 5, 11, 12: 1S1555, 1S2076 or DS442B
D3, 7: 1S188FM-1
D4, 8~10, 13, 14: DS442B

TUNER UNIT
(HWE-162)



BFC SWITCH UNIT



Q, IC	Q6	Q9 Q8 Q7	Q10 Q11 Q14 Q13 Q12	IC3 Q1	Q3 Q2	IC2 Q5 Q4	IC1
ADJ	T10		TC6 TC8 TC7 T7 T8 T9	TC5 TC2 TC1 TC4 TC3 R40 VR2 T3 T6 L4 T1 T2		VR1	T4 T5

Fig. 11

EXPLODED VIEW

- **Parts List**

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Cabinet (Page 48)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
★	12.	HXA-739	Front Case Assy	HXA-837	Front Case Assy
	41.	HXA-760	Support Panel Unit	HXA-844	Support Panel Unit
★	42.	HAC-233	Knob (BFC)	HAC-231	Knob (BFC)
★	71.	HNS-473	Rear Case	HNS-547	Rear Case
★		——	——	HAA-198	Knob (BAND)

Chassis (1) (Page 51)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
	8.	HXA-841	Back Plate Unit	HXA-842	Back Plate Unit
	66.	HXA-847	Tuning Assy	HXA-791→retired	Tuning Assy

HXA-847

Chassis (2) (Page 54)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
	1.	HWH-117	Main Amp Assy	HWH-118	Main Amp Assy
⚠	5.	HKP-107	Socket	HKP-109	Socket
	7.	BNC30P100FMC	Screw (Dial Pulley)	HBA-140	Screw (Dial Pulley)
★★	47.	HSK-119	Switch (BFC)	——	Deleted
⚠ ★	54.	HTT-160	Power Transformer	HTT-166	Power Transformer, 220V 240V AC
	71.	HNM-330	Shield	HNM-300	Shield
	75.	HNC-507	Washer	HBE-124	Washer
	84.	HTX-137	Antenna Unit	HTX-131	Antenna Unit
	85.	HCL-110	Variable Capacitor	HCL-114	Variable Capacitor
	86.	HDE-203	Connector (7P)	HDE-255	Connector (7P)
	94.	HWE-157	Tuner Unit	HWE-162	Tuner Unit
	95.	CNV-863	AC Cap	CNV-977	AC Cap
	97.	HKR-103	Fuse Holder	HKR-102	Fuse Holder
⚠ ★★	98.	HEK-116	Fuse, 5A	HEK-115	Fuse, 4A
★★		——	——	HSH-123	Switch (BFC)
		——	——	BNC30P080FMC	Screw (BFC)
		——	——		Holder (BFC)
		——	——		P.C.Board (BFC)
★★		——	——	HSD-120	Switch (Voltage Selector)
★★		——	——	HSH-124	Switch (BAND)
		——	——		Bracket (BAND)

Page 51

SK-900/KC		SK-909L/HT,HB	
Assembly	**Unit**	**Assembly**	**Unit**
Amp Assy (HWX-367)	LED Unit (A) Switch Unit Mic Amp Unit Control Unit Pre Amp Unit	Amp Assy (HWX-368)	LED Unit (A) Switch Unit Mic Amp Unit Control Unit Pre Amp Unit BFC Switch Unit

Packing Method (Page 69)

SK-900/KC				SK-909L/HT,HB	
Mark	**No.**	**PartNo.**	**Description**	**Part No.**	**Description**
	2-1.	HRB-171	Owner's Manual (English)	HRB-179	Owner's Manual (English)
	2-2.	HRB-172	Owner's Manual (French)	HRD-171	Owner's Manual (SK-909L/HT) (French, German)
⚠	2-3.	CDG-029	AC Cord	HDV-101	Cord Assy (SK-909L/HT)
				HDV-102	Cord Assy (SK-909L/HB)
				HRN-102	Card
				HRN-103	Card (SK-909L/HT)
	7.		Carton		Carton (SK-909L/HT) Carton (SK-909L/HB)

ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 X 10^1 561 ..... RD1/4PS 5 6 1 J

47kΩ 47 X 10^3 473 ..... RD1/4PS 4 7 3 J

0.5Ω OR5 ..... RN2H 0 R 5 K

1Ω 010 ..... RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 X 10^1 ..... RN1/4SR 5 6 2 1 F

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
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  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Tuner Unit (HWE-162)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	LA1140	IC1
★★	LA3365	IC2
★★	M51204L	IC3
★★	2SC1674-L	Q1
★★	2SC1674-L or 2SC2786-L	Q2
★★	2SC1675-L or 2SC2787-L	Q3,Q8,Q9
★★	2SC1675 or 2SC2787-L	Q4
★★	2SC945-P or 2SC1815-GR	Q5,Q10–Q13
★★	2SC461-B or 2SC380TM-O	Q6,Q7
★	VACANT	D1
★	1S1555 or 1S2076 or DS442B	D2,D5,D11,D12
★	1S188FM-1	D3,D7
★	DS442B	D4,D8–D10,D13,D14
	VACANT	D6
	CTF-010	L1 Ferri-Inductor, 2.2μH
	CTF-039	L2 Ferri-Inductor
	HTF-115	L3 Ferri-Inductor, 0.47μH
	HTX-131	L4 Antenna Unit
	VACANT	L5
	HTC-192	L6,L7 Coil
	CTC-061	T1 Coil
	HTC-135	T2 Coil
	CTC-028 or CTC-040	T3 Coil
	CTC-122	T4 Coil
	CTC-123	T5 Coil
	HTC-139	T6 Coil
	HTC-177	T7 Coil
	HTC-164	T8 Coil
	HTC-189	T9 Coil
	HTE-129	T10 Coil
	HTE-124	T11 Coil
	HCL-114	TC1,TC2, VC1–VC4 Variable Capacitor
	HCG-108	TC3,TC6 Trimmer
	CCG-069	TC4,TC5,TC7,TC8 Trimmer
	HWW-106	BPF Filter
	CTF-038	CF1,CF2 Ceramic Filter
★	CCP-145	VR1 Volume, 10kΩ (B)
★	CCP-143	VR2 Volume, 4.7kΩ (B)
★★	HSH-125	S1 Switch (BAND)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1–R7, R10–R20, R22–R24,R28–R39, R42, R44–R47, R49–R56, R58–R68, R70, R71, R73–R75, R83–R85
	RD¼VM □□□J	R21, R25–R27, R40, R41, R48, R57, R69, R76–R82
	VACANT	R8,R9,R43,R72

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 100D 50	C1,C2
	CCDRH 180J 50	C3
	CKDYF 103Z 25	C4,C11,C20,C22,C82
	CCDCH 030C 50	C5
	CCDSH 330J 50	C6,C17
	VACANT	C7
	CCDCH 100D 50	C8
	CCDCH 010C 50	C9
	CCDSL 101K 50	C10,C51
	CKPYX 103N 25	C12,C19,C21,C80
	VACANT	C13,C14
	CCDLH 300J 50	C15
	CCDRH 100D 50	C16
	CCDSH 180J 50	C18,C62
	CKDYF 403Z 25	C23, C24, C29, C30, C32, C49, C59, C67,C71–C73,C86,C87
	CEA 470M 10L	C25,C28,C58,C74
	CCDSL 330K 50	C26,C35
	CEA 010M 50L	C27,C37,C42,C44,C47,C83
	CEA 2R2M 50L	C31,C84
	CEA 4R7M 25L	C33
	CKPYY 223N 16	C34,C55
	VACANT	C36
	CQMA 473K 50	C38
	CQSH 102J 50	C39
	CEA R47M 50L	C40,C41
	CKDYB 561K 50	C43,C57
	CQMA 153K 50	C45,C46
	CEA 100M 16L	C48,C75
	CCDRH 040D 50	C50
	CCDSH 120J 50	C52
	CCDSH 050D 50	C53
	CCDSH 470J 50	C54
	CKDYD 103M 50	C56,C68,C69,C77,C78
	CCDSH 060D 50	C60
	CCDUJ 150J 50	C61
	CCDPH 181J 50	C63
	CQPA 562J 50	C64
	CQSH 361J 50	C65
	CQSH 271J 50	C66
	CQMA 182K 50	C70
	CCDSL 101J 50	C76
	VACANT	C79
	CQMA 333K 50	C81
	CEAR15M 50	C85
	CCDSL390K 50	C88,C89

BFC Switch Unit

Mark	Part No.	Symbol & Description	
★★	HSH-123	S1	Switch (BFC)
	CKDYB 272K 50	C251	

Main Amp Unit (Page 64)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
	RD¼VS 331J	R28	RD½PS 331J	R28
	RD¼VS 393J	R30	RD½PS 391J	R30
	RD½PS 335J	R38	—	Deleted

Fuse Unit (Page 65)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
⚠ ★★	HEK-116	Fuse,5A	HEK-115	Fuse,4A

Pre Amp Unit (Page 65)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
	HTX-126	OSC	HTX-132	OSC
	CKPYB102 K50	C93	CKDYB 272 K50	C93

Control Unit (Page 66)

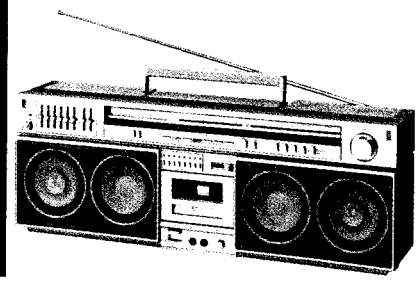
SK-900/KC				SK-909L/HT,HB	
Mark	Part No.	Symbol & Description		Part No.	Symbol & Description
★★	HSK-119	S2	Switch (BFC)	—	Deleted

XP
383

224P

PIONEER®

Service Manual



ORDER NO.
HRT-177-0

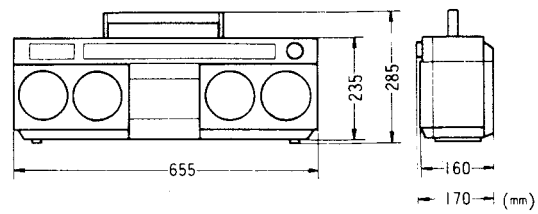
PORTABLE STEREO FM/AM RADIO CASSETTE RECORDER

SK-900

KU,KC

SPECIFICATIONS

Continuous power output	8W+8W/FTC (8Ω, 60~15,000Hz 5% THD.)
Max. music power	40W (total music power)
Speaker	Air-tight cabinet, 12cm (5 in.) mechanical 2 way system with passive radiator
Recording/playback frequency characteristics	50~14,000Hz (±3dB) (Normal tape) 50~15,000Hz (±3dB) (CrO_2 tape) 50~16,000Hz (±3dB) (Metal tape)
Recording/playback S/N ratio	59dB (Dolby NR on, Normal tape) 51dB (Dolby NR off, Normal tape)
Input	AUX, PHONO, MIC (also functions as MIX MIC), EXT. ANT
Output	LINE OUT, PHONES
Subfunctions	Dolby NR, Tape selector (Metal/CrO_2-Normal), Auto/manual recording, Skip search, Music repeat, One side repeat, Automatic editor, Timer stand-by mechanism, 6-band graphic equalizer, FM muting, Stereo microphone mixing
Indicators	Red LEDs: CrO_2, METAL, AUTO EDITOR, REC, PHONO/AUX, AM, FM, FM MODE, STEREO, POWER, SKIP SEARCH (8) Green LEDs: DOLBY NR, PLAY, REW, FF, PAUSE, ONE SIDE REPEAT, MUSIC REPEAT, TAPE Others: ACCESS TUNING (two red, one green), LEVEL (stereo meter)
Frequency range	FM: 88~108MHz AM: 525~1,605kHz
Power source	120V AC, 60Hz; ten size "D" flashlight batteries (1.5V); EXT 15V DC (12~15V)
Dimensions (W×H×D)	655×235×160mm (25-3/4×9-1/4×6-1/4 in.)
Weight	9.9kg (21.8lbs., without batteries)



Note: Specifications and design are subject to change without notice.

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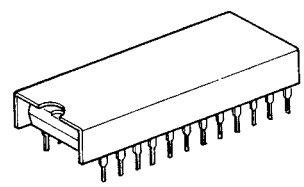
CAUTION

When Handling IC TC4066P, μPD4066C, MSM4001RS, MSM4027RS and MSM4011RS

Please Observe:

IC TC4066P, μPD4066C, MSM4001RS, MSM4027RS and MSM4011RS (IC2 in the pre amp unit, IC11 in the control unit, IC1–IC4, IC6 and IC8 in the logic unit), are C-MOS ICs of extremely low power consumption and very high input impedance. Unless handled with special care, they could be damaged by static electricity induction. These ICs are supplied with a shorting, cap (of aluminium foil) attached. When soldering, or performing other repair work, always attach this cap as shown below. Remove the cap after the repair has been completed.

Also, this type IC must not be inserted in a polystyrene package for storage.



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- **Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.**

1. PARTS LOCATION

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

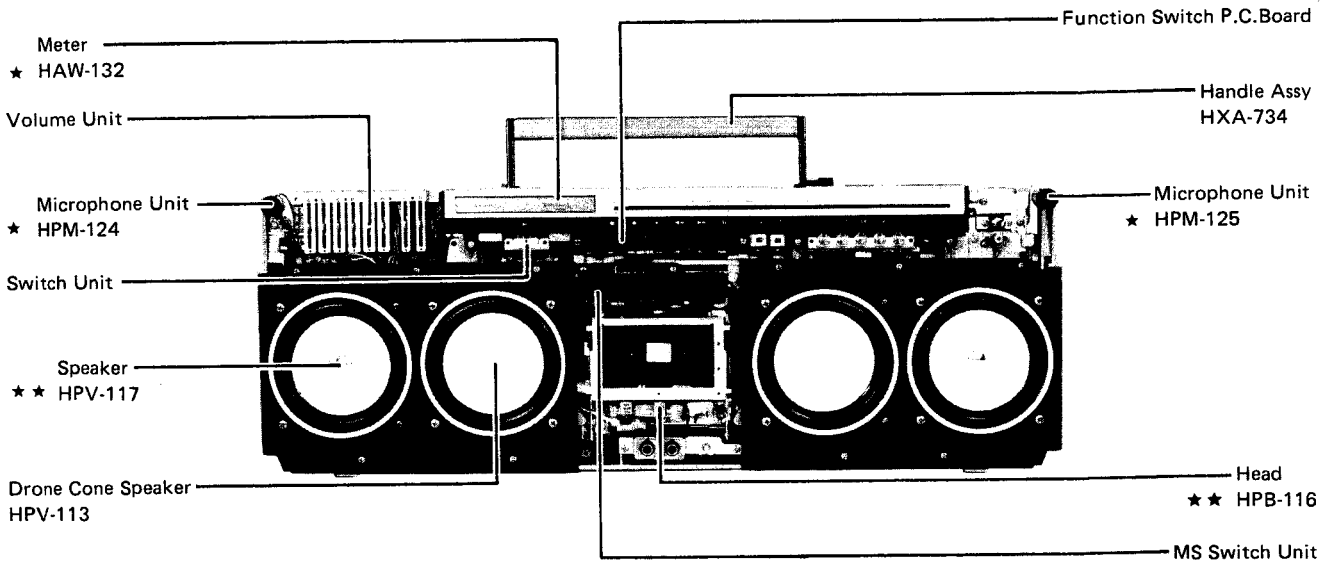


Fig. 1

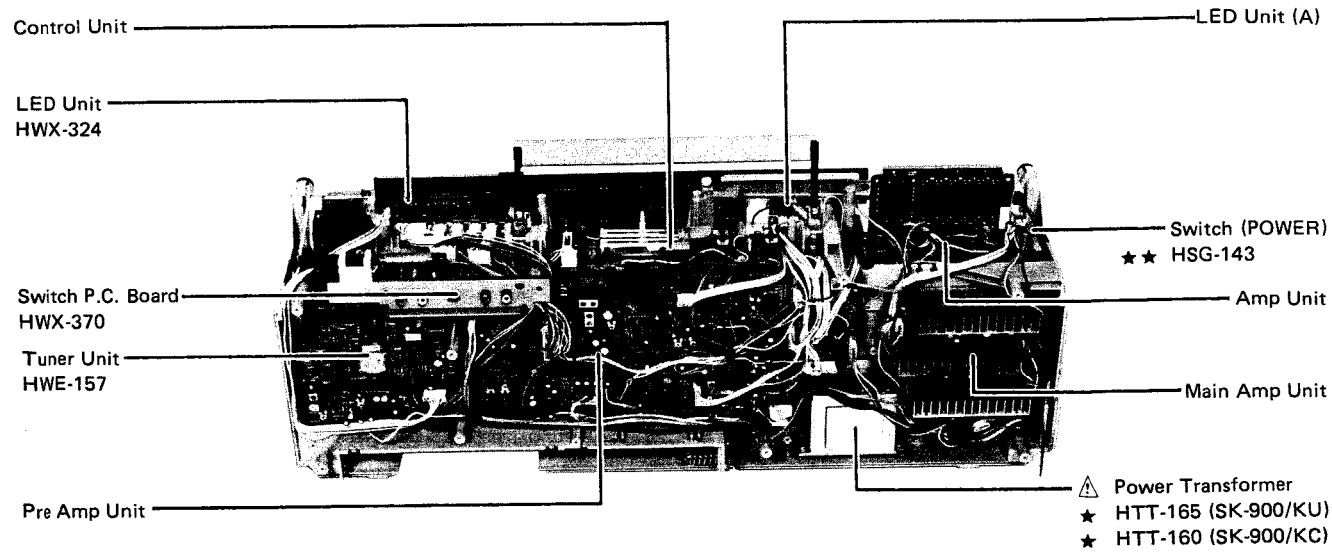


Fig. 2

2. CIRCUIT DESCRIPTION

2.1 TUNER SECTION

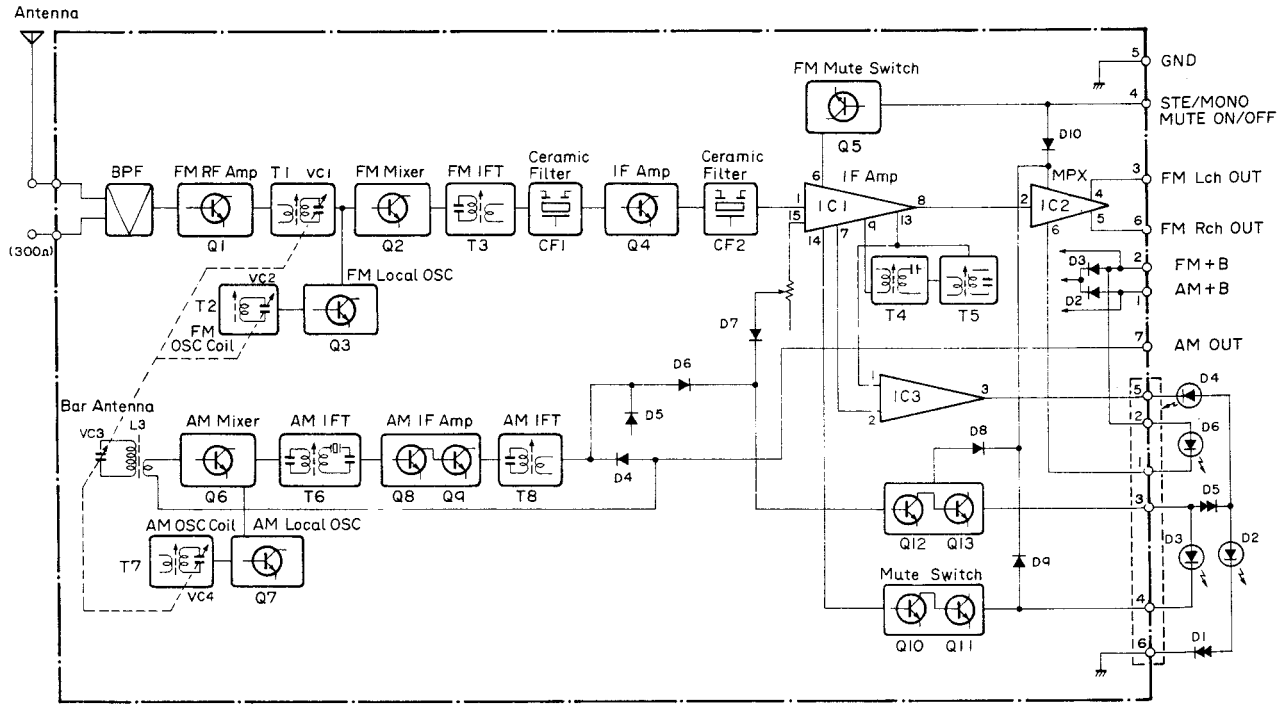


Fig. 3

• FM Front End

The FM front end consists of an one-stage RF amplifier (Q1) with a band pass filter at the front, a base-injected mixer (Q2), and a modified Colpitts local oscillator.

• IF Amplifier and Detector Circuit

The FM IF amplifier consists of two two-element ceramic filters, a pre-amplifier by transistor Q4, and an FM IF system IC(LA1140) that contains six stages of differential amplifiers. LA1140 performs IF amplification, limiting, and detection (quadrature detection).

• FM Muting Circuit

LA1140 also contains a "soft muting" circuit. When the mute switch is on, the circuit "soft-mutes" unwanted noise that occurs when the tuner is not well tuned to station.

• FM Multiplex Circuit

The FM multiplex circuit uses a PLL multiplex IC (LA3361).

• AM Tuner

The AM tuner consists of a built-in bar antenna measuring 120mm, an externally-excited mixer, a two-stage direct coupled IF amplifier made up of transistors, an AGC circuit, a detector circuit, and a signal generator that provides a signal to control the tuning indicator, etc. The AM tuner uses a dual variable capacitor and ceramic filters.

• Tuning Indicator Circuit

When the FM tuner of SK-900 is tuned to a station, the voltage at pin 15 of IC1 (LA1140) increases. The voltage then turns Q13 off, and the voltage at pin 14 lowers at the same time and turns Q11 on, lighting the access sensor LED (green).

If the tuning frequency is a little lower than the frequency of the station to be tuned, Q11, Q13, and IC3 turn off, lighting the red LED (▶) indicating that the tuning frequency has to be raised. If the tuning frequency is a little higher than the frequency of the station to be tuned, Q11 and Q13 turn off and IC3 turns on, lighting the red LED (◀) indicating that the tuning frequency has to be lowered.

If the field strength of the station is too weak to have a sufficient S/N ratio, or if there is no station at all at the tuning frequency, Q13 turns on and none of the LEDs lights.

2.2 LOGIC CIRCUITS

• Flip-flop Circuits

Two types of flip-flop circuits are used in the logic circuits:

The flip-flop circuit at the top of Fig. 7 is used for REC (record), PLAY, and FF (fast forward). When terminal S(set) is made high, output Q turns high and the flip-flop is set. When terminal R (reset) is made high, output Q turns low and the flip-flop is reset.

The REW and PAUSE flip-flop circuits use the other type of flip-flop (bottom of Fig. 7). The REW flip-flop, forming a RS type flip-flop, uses the SET and CLR (clear) terminals with the J,K, and CP terminals kept high. The PAUSE flip-flop operates with terminals J and K kept high; it sets and resets on clock pulses at the CP terminal.

• Initial Condition

The initial condition depends on the position of the Timer standby switch. The following discussion assumes the switch is at the off position.

When the power switch is turned on, the 15V fed to the circuit is then differentiated by C13 and R34. The resulting voltage across R34 is regulated to 8V by zener diode ZD5. This voltage feeds into the R or CLR terminal of the PLAY, FF, REW, and PAUSE flip-flop circuits, and drops the Q terminals low, establishing a "stop state." As for the REC flip-flop, the voltage differentiated by C8 and a group of resistors connected to C8 feeds into the R terminal and create a "stop state."

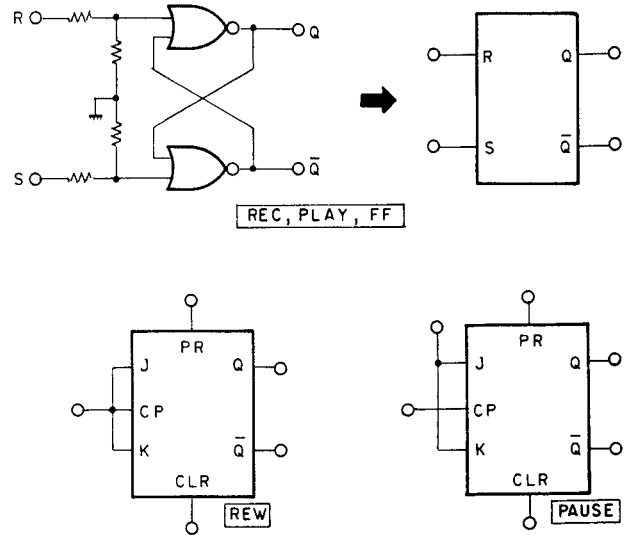


Fig. 4

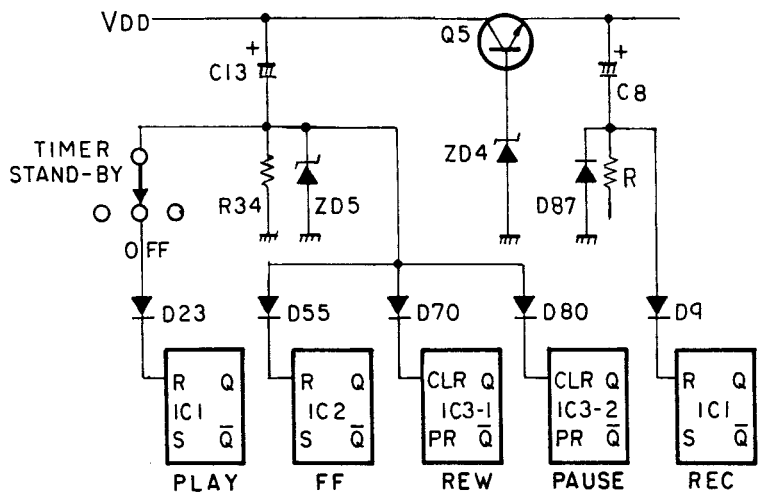


Fig. 5

• Playback Mode

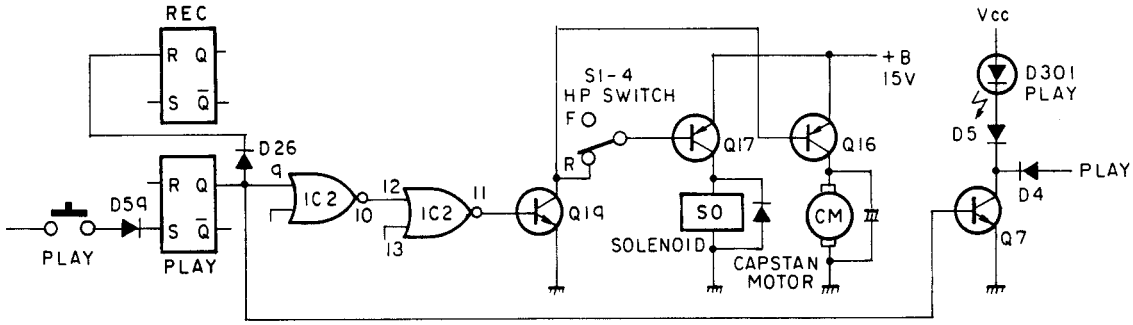


Fig. 6

With the play switch turned on, Vcc feeds into the S terminal of the PLAY flip-flop through D59, setting the Q terminal high. The output at the Q terminal feeds into the R terminal of the REC flip-flop through D26, resetting the Q terminal. The high state at the Q terminal of the PLAY flip-flop also feeds into pin 9 of IC2, making pin 10 and pin 12 low. Because both pin 12 and 13 are low (unless the PAUSE flip-flop is set, pin 13 is also low), pin 11 becomes high turning Q19 on.

Since the HP switch (head plate switch) is at the R (rear) position, Q19 then turns Q17 on, which then activates the solenoid. When Q19 turns on, it also turns Q16 on, starting the capstan motor.

The rotation of the capstan motor advances the head, and the HP switch moves to the F (front) position, which then turns Q17 off and deactivates the solenoid. This completes the steps for the playback mode.

The positive voltage at the Q terminal of the PLAY flip-flop also turns Q7 on, lighting the PLAY LED(D301) and controlling other related circuits through D4.

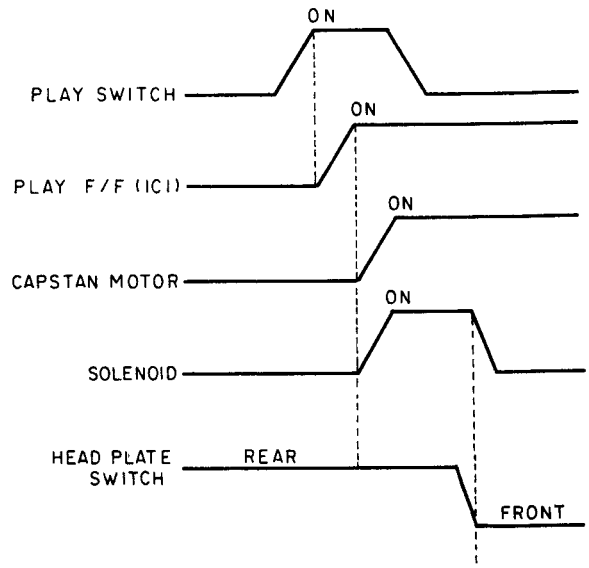


Fig. 7

• Record Mode

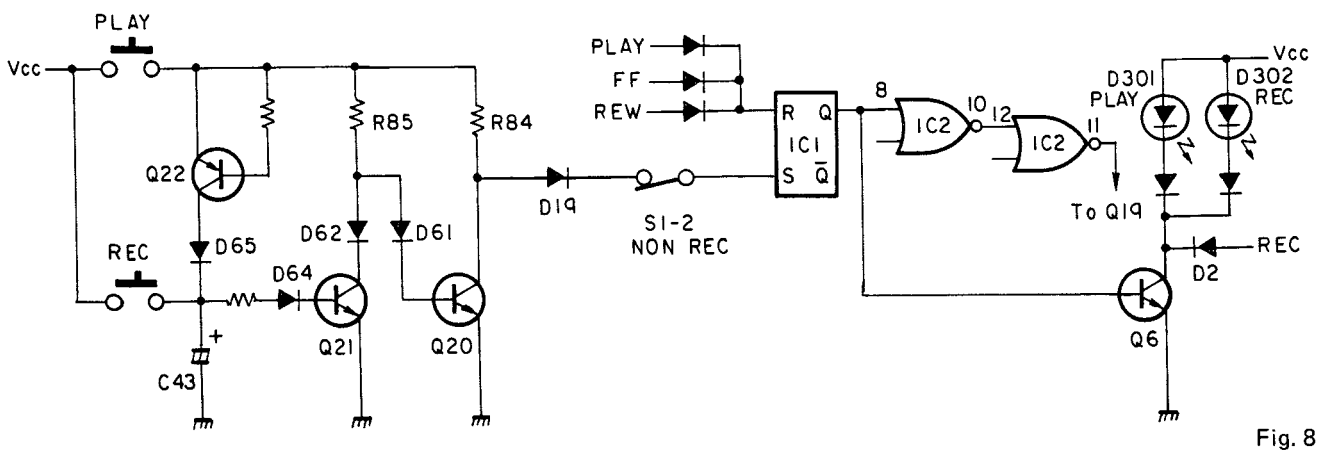


Fig. 8

The logic of the circuit allows the unit to shift into the record mode only when the tape section is not in operation – i.e. in the "stop mode". As can be seen in Fig. 8, in the playback, fast forward or rewind mode, a reset signal continues to feed into the R terminal of the REC flip-flop; and the REC switch cannot reset other flip-flops. And this accounts for the above.

The shift into the record mode, press the Play switch while pressing the REC switch. When the REC switch is pressed, C43 starts charging and becomes 8V. The voltage then turns Q21 on through D64. The reasons for turning on Q21 are as follows:

1) To provide a circuit that turns Q22 on. This circuit, by turning Q22 on, keeps Q21 on even after the REC switch is turned off – i.e. after the Paly switch is pressed.
2) To prevent the trigger voltage generated by the Play switch from entering the PLAY flip-flop by grounding through Q21.

When the Play switch is pressed while Q21 is on, the conducting Q21 cuts off Q20, allowing the trigger voltage to enter the REC flip-flop through D19, and thereby setting the flip-flop.

• Stopping the Record Mode

The circuit to stop the record mode is a little complicated. When the Stop switch is pressed, 8V feeds into each flip-flop as a "stop signal." Since the PLAY, FF, and REW flip-flops are already in the "stop mode" there will be no change in these flip-flops. As for the record circuit, current flows into Q18 through D51 and R75, and turns Q18 on. Because the HP switch is at the F(front) position, Q18 then turns Q17 on, activating the solenoid.

The head base is designed to withdraw when the solenoid is activated while the capstan motor is rotating. So when the solenoid is activated, the HP switch shifts to the R(rear) position, which then deactivates the solenoid. The capstan motor is still rotating while the head base withdraws, but it stops in about 0.2 second by the following process:

With the Stop switch closed, C12 charges instantly through D17, C11, charged through R32, takes some time to step up. When the voltage across C11 rises to a certain value, it resets the REC flip-flop through D12. Then the Q terminal turns low, making pin 8 and pin 9 low, which in turn make pin 10 high. This makes pin 12 high, which makes pin 11 low, which turns Q19 off and thereby Q16 off, stopping the capstan motor. By this sequence, the REC flip-flop resets 0.2 second after the Stop switch is pressed. Until this takes place, the capstan motor keeps rotating, and the audio circuit, which is also governed by the Q terminal, keeps in the record mode.

The REC switch must be pressed first because it prepares the circuit for the record mode; the Play switch actually triggers the circuit. For this reason, it must be possible to release the switches in either order. Q21 and Q22 provide this function.

When the REC switch is pressed, Q21 turns on. When the Play switch is pressed afterward, the current source from Q22 to Q21 is created. If the REC switch is released following the Play switch, no problem arises; if the REC switch is released first, however, the trigger from the Play switch leaks. To prevent this, the circuit of the REC switch must behave, after it is released, as if it were still depressed while the Play switch is still on. Q21, once turned on by the REC switch, is kept on by the Play switch by forming a latch circuit together with Q20. There is also a possibility that chattering may upset the latch circuit and bring the circuit into the playback mode instead of the record mode; a delay made by C43 prevents this.

The positive voltage at the Q terminal of the REC flip-flop turns Q6 on, lighting the PLAY LED (D301) and RED LED (D302) at the same time, and controlling other related circuits. The deck mechanism operates in the same manner as in the playback mode.

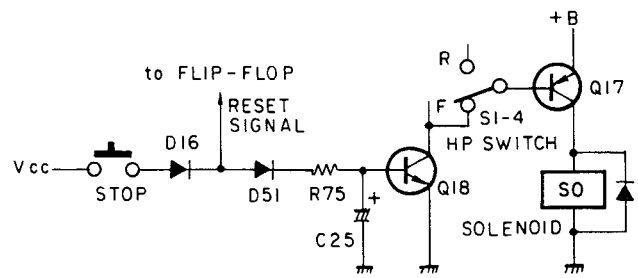


Fig. 9

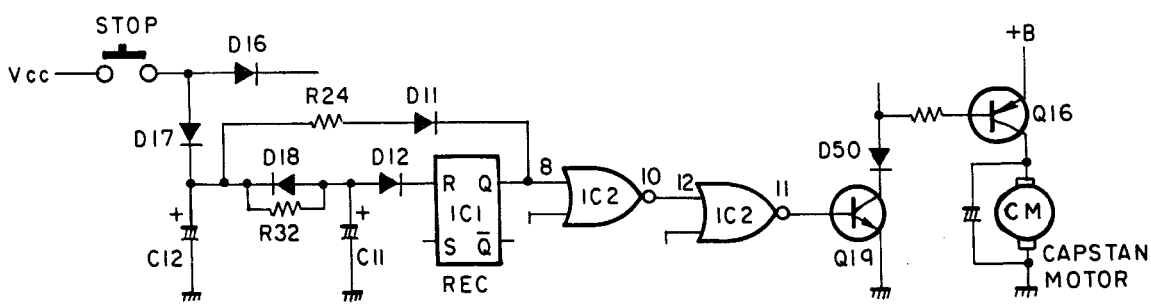


Fig. 10

The reason for this delay is explained as follows:
The head cannot disengage from the tape instantly. Without this delay, therefore, repetitive recordings would result in unerased portions on the tape from the previous recordings.

• Stopping the Record-pause Mode

If the Stop switch is pressed while the unit is in the "record-pause" mode (i.e. record mode with pause), the PAUSE flip-flop resets immediately after the switch is pressed. If the REC flip-flop were to reset after a delay of 0.2 second as in the record mode, the capstan motor would start immediately after the Stop switch is pressed. To avoid this, a circuit that cancels the delay circuit is provided.

When the Stop switch is pressed, the voltage resets the PAUSE flip-flop through D16, raising the voltage at $\overline{Q}$ from low to high. The differential circuit of C44 and R116, sensing positive voltage transition at $\overline{Q}$, generates a short pulse across R116. The pulse then resets the REC flip-flop. This way, the REC flip-flop resets immediately together with the PAUSE flip-flop.

The delay allows the head to stay in the record mode until the head base completely withdraws.

D18, R24, and D11 help discharge C11 and C12 rapidly C11 ensures the delay even when the Stop switch is pressed for a very short period.

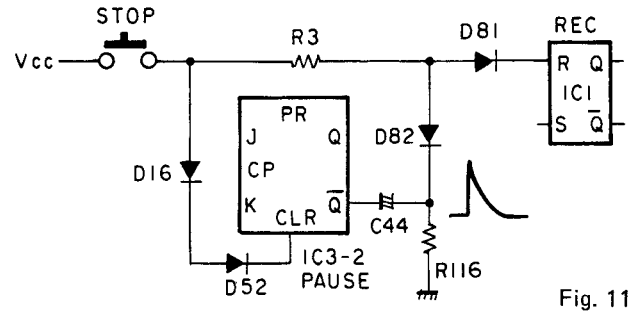


Fig. 11

In the record mode, as opposed to the record-pause mode, a push of the Stop switch does not reset the REC flip-flop from this circuit, because the voltage divided by R3 and R116 is too low (R3≫R116), and no pulse appears across R116 since $\overline{Q}$ is already high and therefore does not step up.

• Pause Mode

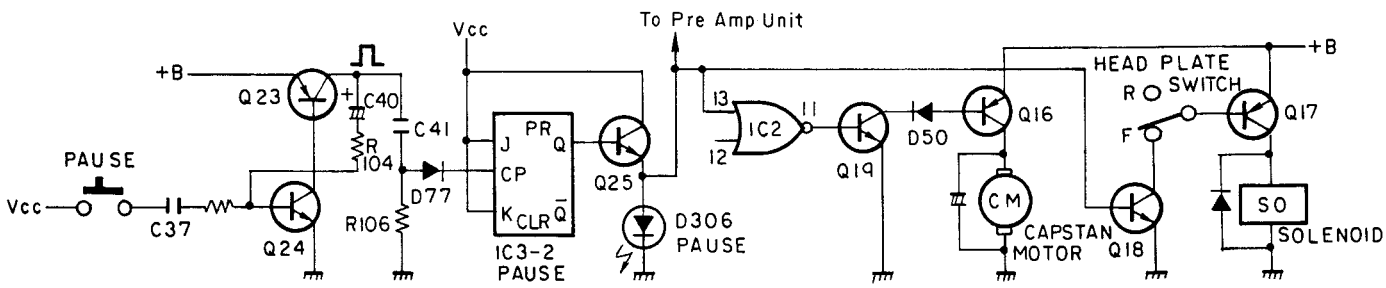


Fig. 12

The Pause circuit uses a J-K flip-flop as a T flip-flop; a push of the Pause switch sets the flip-flop, and another push resets it and so forth.

After power is applied to the flip-flop, the CLR terminal of IC3 is made high, which then resets the flip-flop, making terminal Q low and terminal $\overline{Q}$ high. This is the initial state of the flip-flop.

Q23 and Q24 form a one-shot multi-vibrator. The following discribes how this circuit operates: When the Pause switch is closed, 8V feeds into the base of Q24 through C37, turning Q24 on; Q24 in turn turns on Q23 by grounding the base of Q23, which then raises the collector voltage of Q23 to almost as high as the emitter voltage. Because C37 charges very rapidly, the current that has turned on Q24 soon disappears. However, because the high voltage at the collector of Q23 feeds current back to the base of Q24 through C40 and R104, both transistors stays on as long as C40 is not fully charged. When C40 is charged fully, Q24, losing the base current, cuts off, which then turns Q23 off.

In other words, a push of the Pause button creates, at the collector of Q23, a pulse of which the width is determined by the time constant of C40 and R104.

This pulse then feeds into a differential circuit of C41 and R106. The resulting short pulse across R106 feeds into the CP terminal. Since this flip-flop is a T flip-flop, each pulse changes the state of the flip-flop — i.e. from set to reset and vice versa.

When the Q terminal becomes high (i.e. the flip-flop is set), the voltage turns Q25 on, thereby lighting the Pause LED(D306) and sending a positive voltage to other related circuits.

• Fast-forward and Rewind Mode

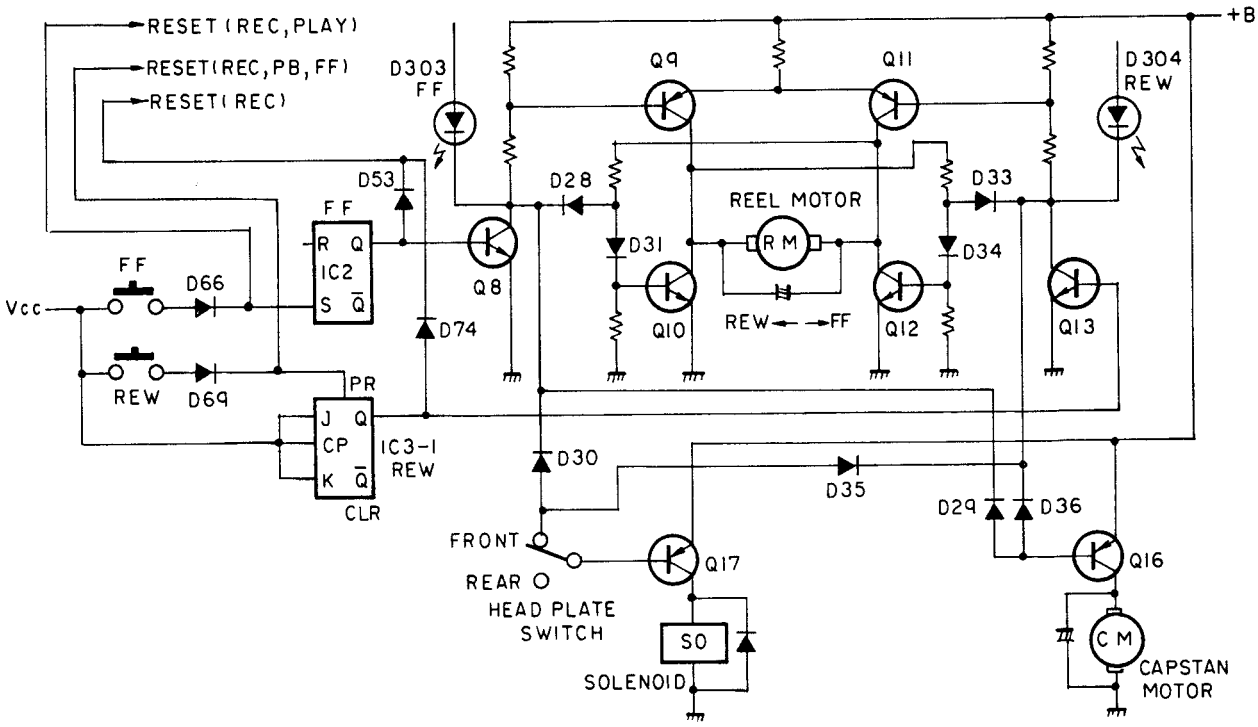


Fig. 13

When the FF switch is closed, Vcc (8V) sets the FF flip-flop through D66, and at the same time resets the REC, PLAY and REW flip-flops. With the FF flip-flop set, the Q terminal becomes high and turns on Q8 and Q9. When Q9 is turned on, current flows through D34 into the base of Q12, turning Q12 on. With Q9 and Q12 conducting, current flows from Q9 to Q12 through the reel motor, rotating the reel motor in the FF direction.

When Q8 is turned on, the base of Q10 becomes grounded through D28. This prevents Q9 and Q10 from turning on at the same time – even when Q13 mistakenly turns on. The capstan motor keeps rotating during the fast forward mode, since Q16 keeps conducting due to the current flowing through the path of Q16 → D29 → Q8 → Ground.

The head base needs to be withdrawn during the fast forward mode. Because the HP switch is at the F (front) position when the head base is advanced, Q17, turned on by the current flowing through the path of Q17 → HP switch → D30 → Q8 → Ground, activates the solenoid and withdraws the head base.

The rewind mode works similarly. When the REW flip-flop is set, Q13, Q11 and Q10 turn on. Current then flows from Q11 through the reel motor into Q10 – the direction opposite to that of the fast forward mode. The capstan motor keeps turning since Q16 is turned on by the current flowing through the path of Q16 → D36 → Q13 → Ground. The head base is withdrawn by the solenoid, which has been activated by the current flowing through the path of Q17 → HP switch → D35 → Q13 → Ground.

• Timer Standby Circuit

The timer standby switch has three positions: OFF, REC, and PLAY. Details of each position are as follows:

OFF position – As soon as the power is turned on, a reset pulse feeds into all the flip-flops and resets them.

REC position – when the power is turned on, a reset pulse generated by the time constant created by C8 and a group of resistors connected to C8 resets the REC flip-flop. At the same time, a set pulse generated by the time constant of C13 and R34 enters the S terminal. Because the time constant of C13 and R34 is far greater than that of C8 and R23, the set pulse at the S terminal lasts longer. So, as soon as the reset pulse is gone, the set pulse sets the REC flip-flop.

PLAY position – The operation of the PLAY position is similar to that of the REC position. It first resets then sets.

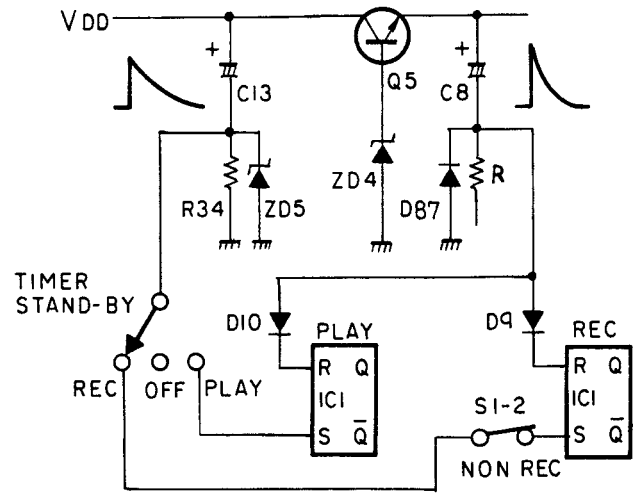


Fig. 14

• Editor

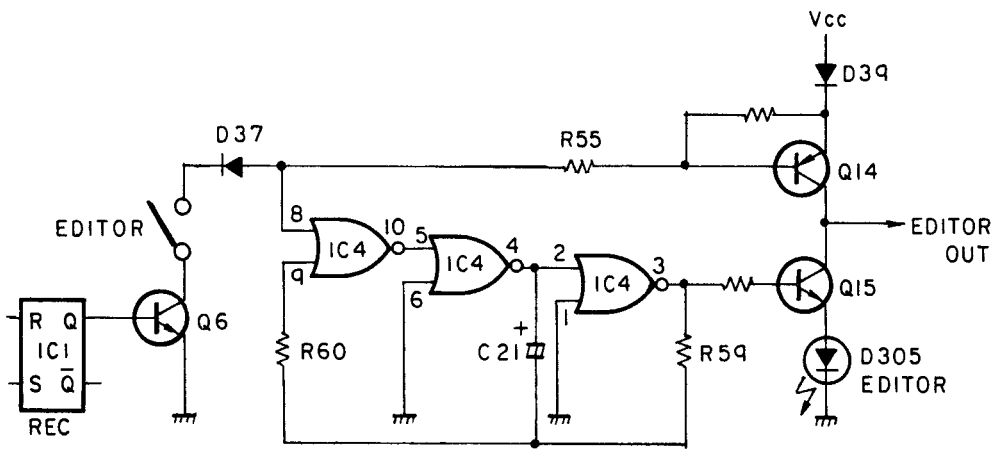


Fig. 15

If the Editor switch is pressed while recording, Q14 turns on and sends a signal to other related circuits. While the editor is in operation, the LED goes on and off in a cycle of about one second.

When the Editor switch is off, pin 8 of IC4 is high, which makes pin 10 low, which makes pin 4 high, keeping pin 3 stable at low.

When the Editor switch is turned on, pin 8 becomes low. Pin 9 is low too, at that time, because it is connected to pin 3 through R60 and R59, and C21 is fully charged. With both pin 9 and pin 8 low, pin 10 turns high, making pin 4 low, and thereby pin 3 high. The high state at pin 3 then turns Q15 on, and lights the LED (D305). As soon as pin 3 turns on, C21 discharges and then starts recharging in the opposite polarity. When the recharging has advanced to some extent, pin 9 becomes high and reverses the state of the other pins, turning off the LED. Because the time constant of C21 and R59 is such as to create a cycle of about one second, D305 stays on for about 0.5 second and goes off for about 0.5 second and so forth.

- **Setting Pause**

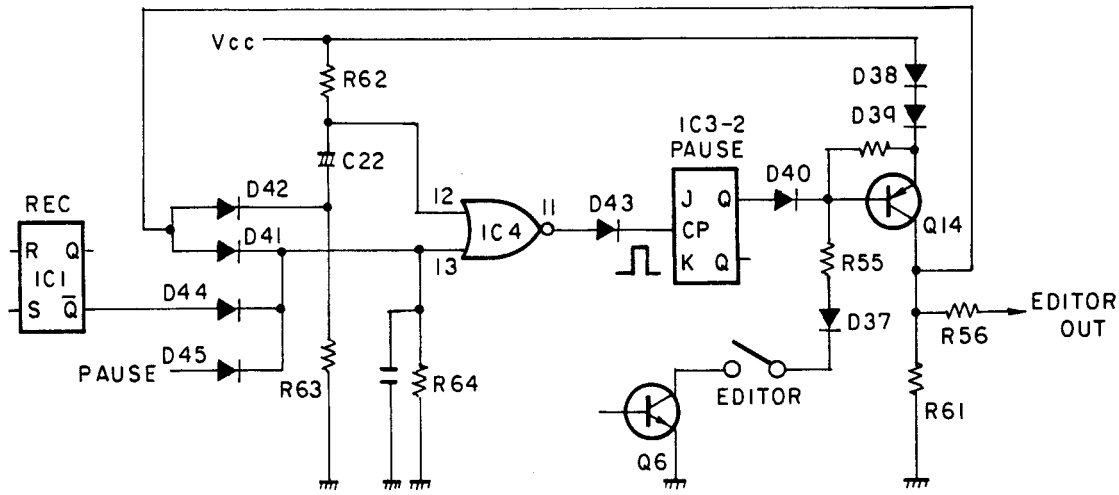


Fig. 16

When editor terminates, the unit has to be put in the pause mode. The following discribes how the pulse to trigger the PAUSE flip-flop is generated.

While in the editor mode, pin 13 of IC4 is high due to the positive voltage across R64 developed by the current from Q14 through D41. Pin 12 is also high because of the positive voltage acorss R63 developed by the current from Q14 through D42. When the Editor switch is pressed at first, C22 discharges through the path of R62 → D38 → D39 → Q14 → D42 → C22. Because both pin 12 and pin 13 are high, pin 11 is driven low.

When the Editor switch shuts off, Q14 turns off. Pin 13 becomes 0V (=low) since no current flows from Q14 into R64. As for pin 12, the voltage across R63 disappears, causing a current from R62 toward R63. Since R62 is far greater than R63, voltage drop by the current mostly takes place across R62, which then brings the voltage at pin 12 to low. It continues to be low until C22 is sufficiently charged to exceed the threshold voltage of IC4.

As both pin 13 and pin 12 become low, pin 11 becomes high. The high state at pin 11 then brings the Q terminal of the PAUSE flip-flop high via D43. After the PAUSE flip-flop is set, Q14 cannot be turned on by the Editor switch because of the reverse bias from the Q terminal through D40. This prohibits the editor mode while in the pause mode.

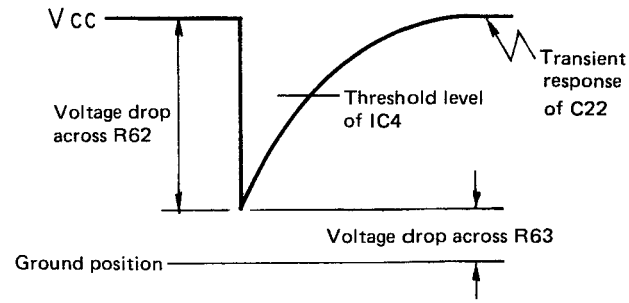


Fig. 17

When the charging of C22 advances, and the voltage at pin 12 exceeds the threshold level of IC4, pin 12 becomes high, which then makes pin 11 low, eliminating the pulse that has set the PAUSE flip-flop.

The pulse width depends on the threshold level of the IC used. However, since the PAUSE flip-flop senses the edge of the trigger pulse, varietly in pulse width is permitted to some extent.

• Auto Editor

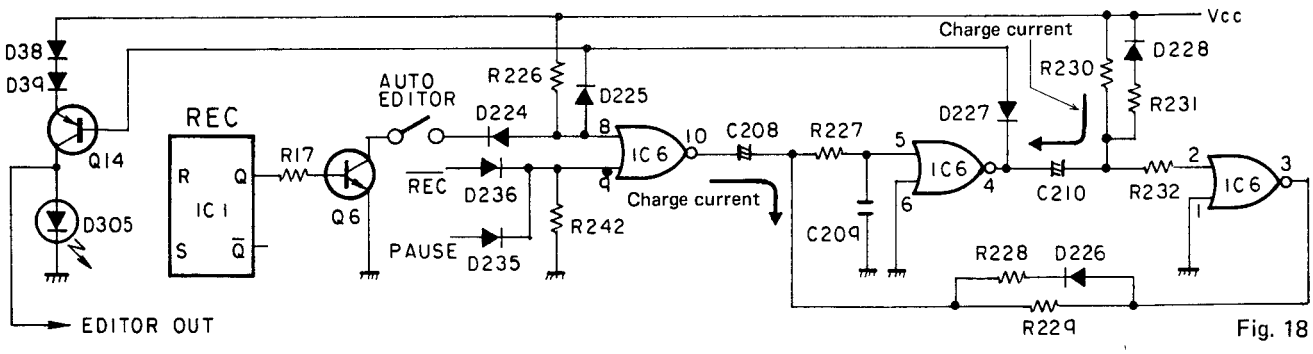


Fig. 18

The Auto Editor circuit operates only when the unit is recording. When the unit is in other modes, the positive voltage at D236 disables the circuit. Also, if the Pause button is pressed while in the record mode, the positive voltage at D235 disables the circuit.

Before this circuit is set in operation, pins 8, 4, and 2 are high and pins 10, 5, and 3 are low. C208 is left uncharged because both of the poles are low. C210 is also left uncharged because both of the poles are high.

When the unit is put in the record mode (i.e. without pause), pin 9 becomes low. If the Editor switch is then closed, pin 8 turns low and pin 10 turns high. This positive voltage at pin 10 starts charging C208 with the current flowing through R229 toward pin 3, and at the same time it reverses the state of the other pins, making both of the poles of C208 high, and stopping the charging of C208.

C210 keeps charging with the current flowing from R230 toward pin 4 which has just become low. The low voltage at pin 4 also brings pin 8 low through D227 and D225, alienating the effect of the Auto Editor switch.

When the charging of C210 advances sufficiently to drive pin 2 high, pin 3 turns low, which then starts charging C208 with the current flowing toward pin 3. After pin 3 turns low, the voltage at pin 5, which has been kept high by pin 3, stays high for the time being because C208 is being charged; as the charging advances, however, the voltage gradually decreases until it is finally low enough to reverse the state of pin 4 to high. When – and only when – pin 4 is low, Q14 conducts and sends a signal to other related circuits.

The above sequence takes about 5.5 seconds and keeps the unit in the editor mode during the period.

• One Side Repeat

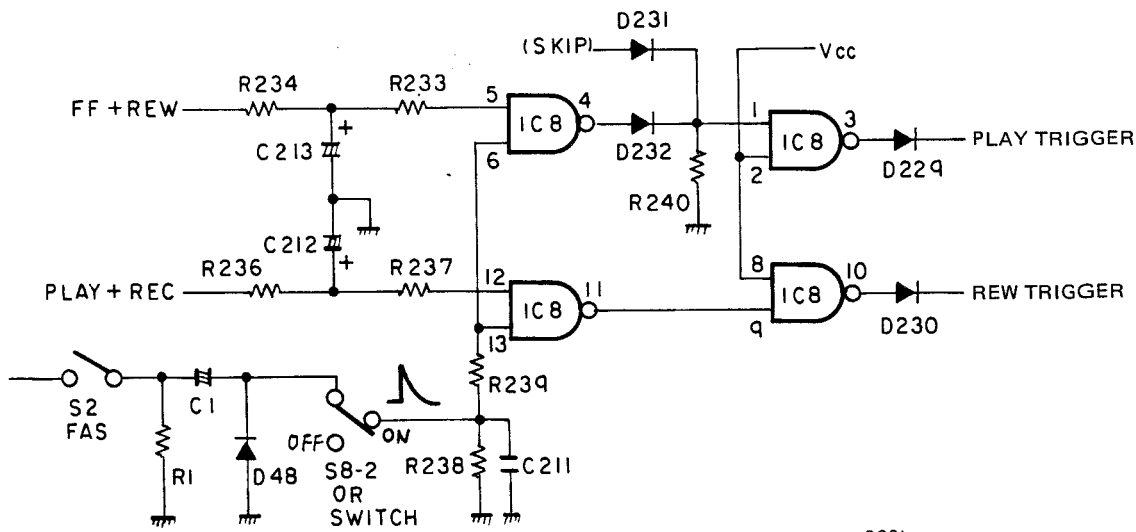


Fig. 19

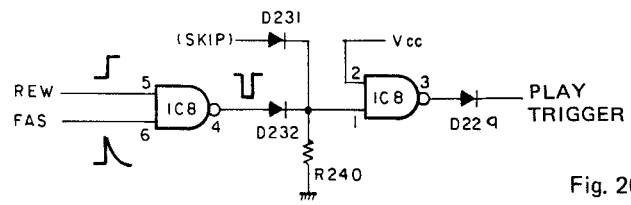


Fig. 20

The One Side Repeat circuit allows the user to rewind and replay the same side of the tape after it comes to the tape end.

When the unit is in the playback or record mode, pin 12 of IC8 is high. If the tape ends and the FAS (full automatic stop) switch closes thereafter, a positive pulse develops and feeds into pin 13 (and pin 6). Since IC8 is a NAND gate, the positive input into pin 12 and 13 then turns pin 11 low and therefore pin 9 low, which in turn turns pin 10 high, generating a REW trigger pulse. The trigger pulse immediately activates the rewind circuit.

Since the FAS switch, which operates mechanically, does not respond as quickly as electronic circuits, the positive voltage at pin 6 (and pin 13) may last for some time. To avoid both pin 5 and pin 6 becoming high at the same time, the time constant of R234 and C213 delays the REW signal into pin 5.

After the rewinding finishes and brings the tape to the beginning, the FAS switch turns on again and supplies a positive pulse to the circuit. The pulse then turns pin 6 high. Pin 5 is high because the unit has been in the rewind mode. With both pin 5 and pin 6 high, pin 4 turns low, which then brings pin 1 low, turning pin 3 high. The positive voltage at pin 3 then triggers the PLAY circuit, and immeidately sets the unit in the play mode.

Just as R234 and C213 delay the REW signal, R236 and C212 delay the PLAY signal. This delay prevents the unit from reciprocating between the play and rewind modes after a FAS pulse is fed.

• Music Repeat

The Music Repeat is similar to the One Side Repeat. The difference is that the Music Repeat uses PMS pulses instead of FAS pulses.

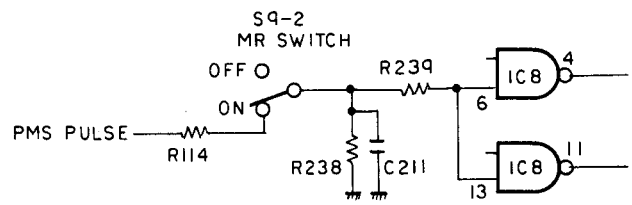


Fig. 21

• Auto Stop

When the tape reaches the end or the beginning, the FAS switch turns on and a pulse is generated. This pulse resets all the flip-flops.

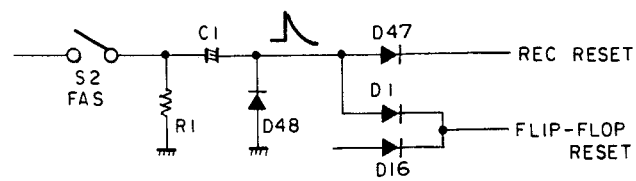


Fig. 22

2.3 BLOCK DIAGRAM

• Playback Mode

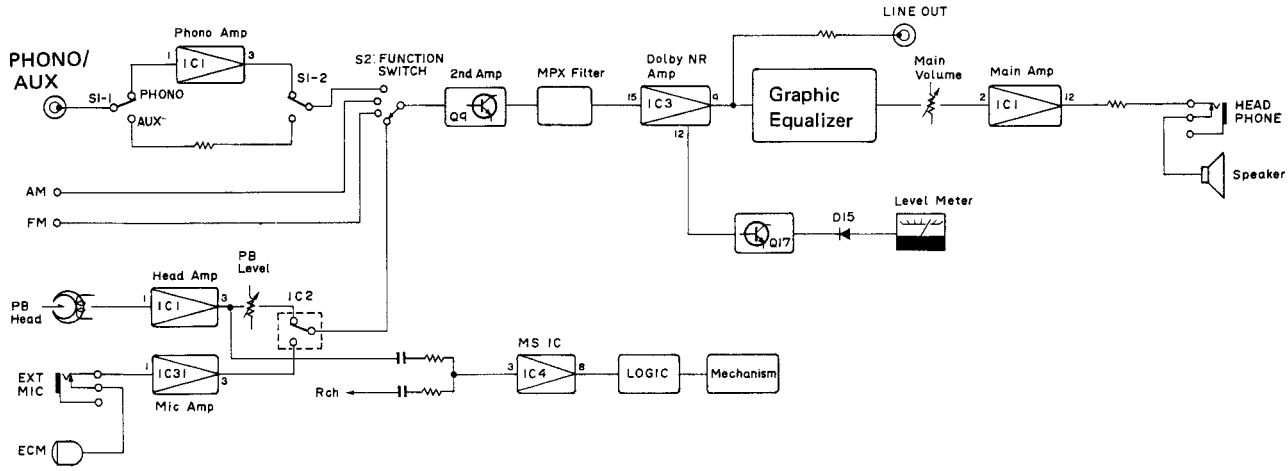


Fig. 23

• Record Mode

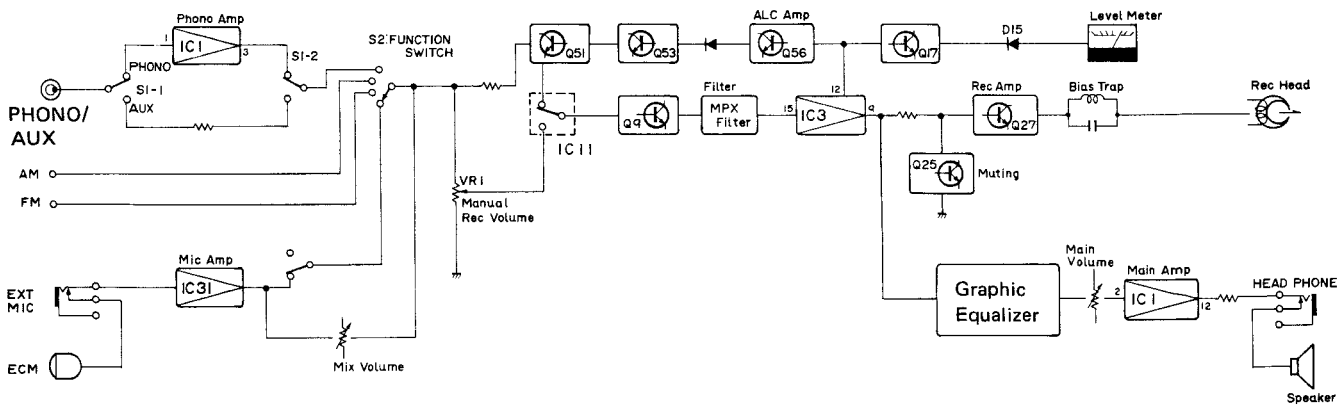


Fig. 24

2.4 LEVEL DIAGRAM

- **Playback Mode**

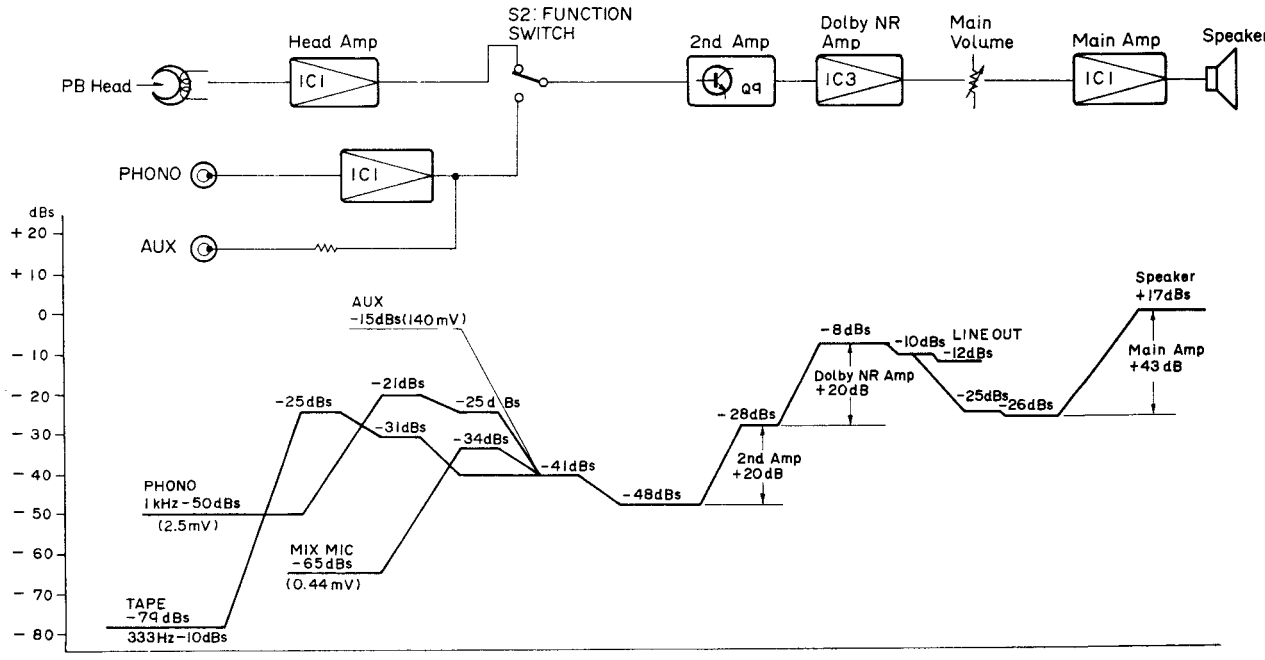


Fig. 25

- **Record Mode**

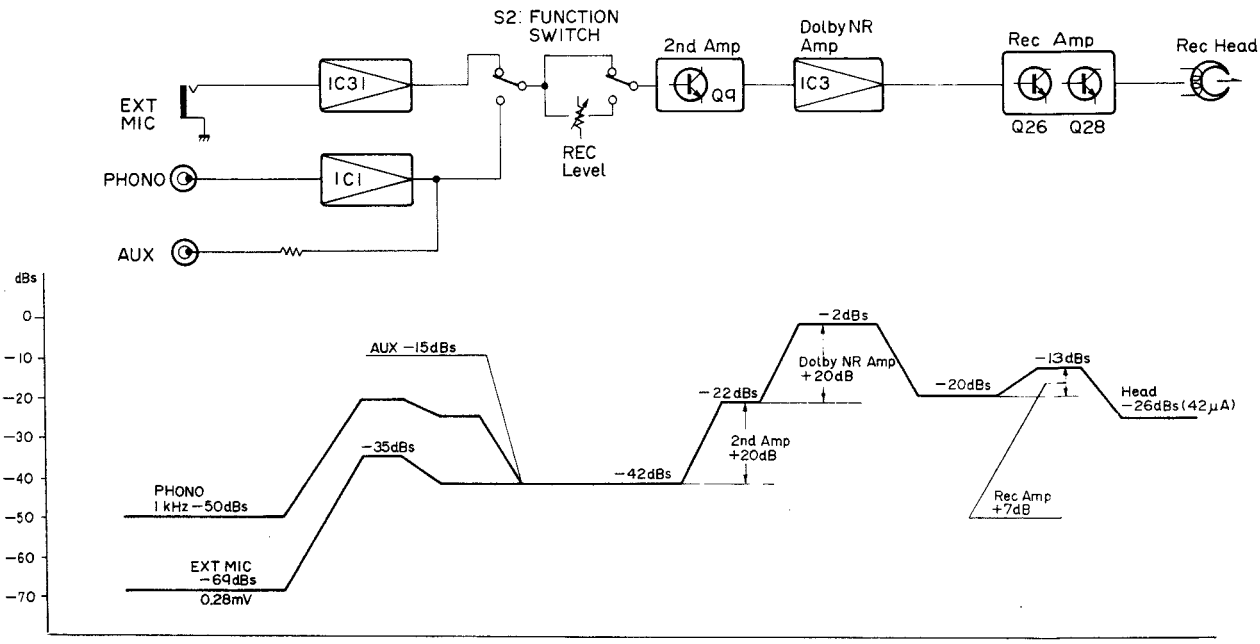


Fig. 26

3. MECHANISM DESCRIPTION

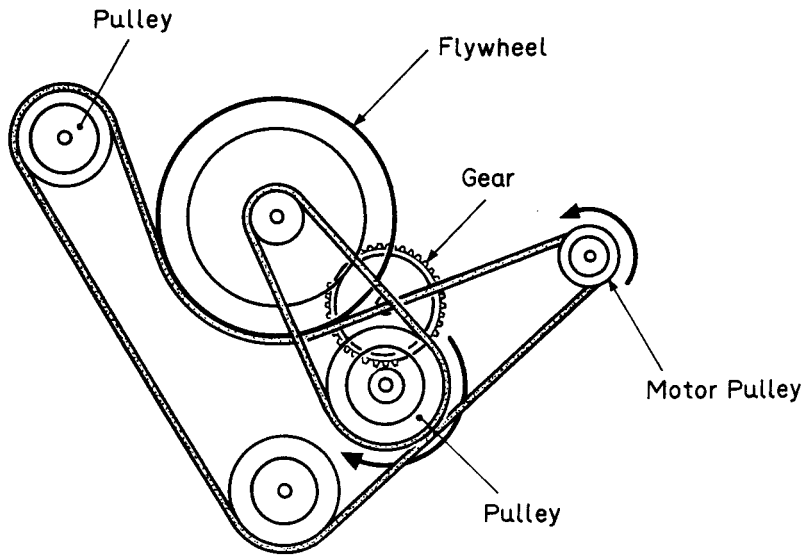


Fig. 27

- **Starting Playback**

1. When the Play switch is turned on while the unit is in stop, the battery voltage applies to terminal (14), turning the capstan motor. The rotation of the capstan motor, via the flywheel and pulley, then drives the gear. The same voltage also applies to terminal (11) and activates the solenoid.
2. The pulley turns the gear which is notched to catch in the pawl at every half turn. When the gear turns a quarter turn, the pawl does not catch the notch of the gear because the solenoid is on at that time.
3. With another half turn of the gear, the solenoid turns off. The gear is then caught and locked by the pawl.
4. When the gear turns to the right, as described in item 2, levers (B) and (A) move upward. Lever (A) then makes the TP unit touch the reel unit so that the reel unit turns. Lever (B) moves in the direction indicated by the arrow. The movement pushes down the head base which has been held by lever (B). The same movement of lever (B) also pushes lever (C). Lever (C) then switches S1-1 (HP switch) from R (rear) to F (front), deactivating the solenoid.
5. Lever (A), at the same time, presses the pinch roller to the capstan.

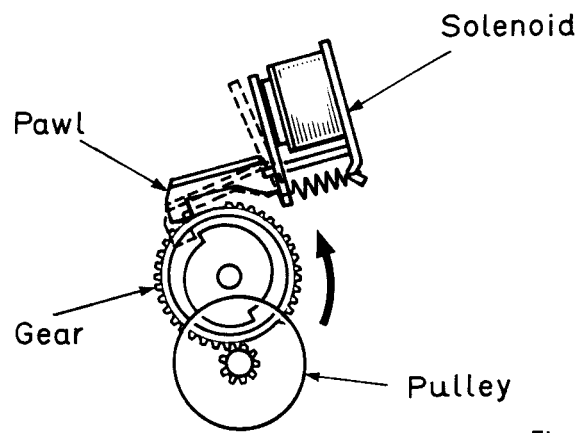


Fig. 28

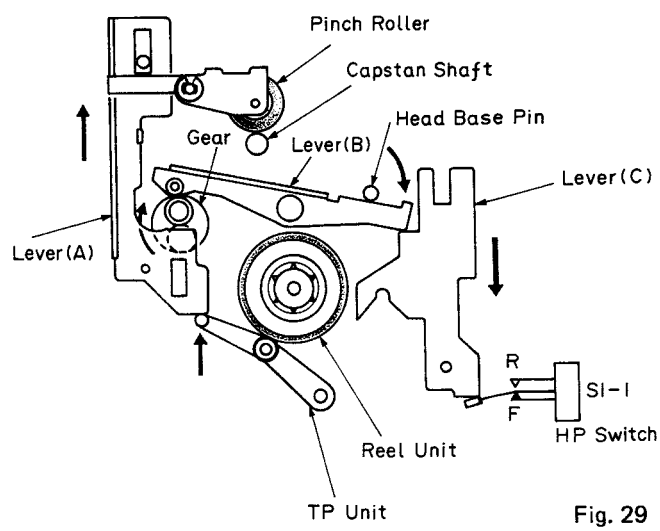


Fig. 29

• Automatic Stop Mechanism

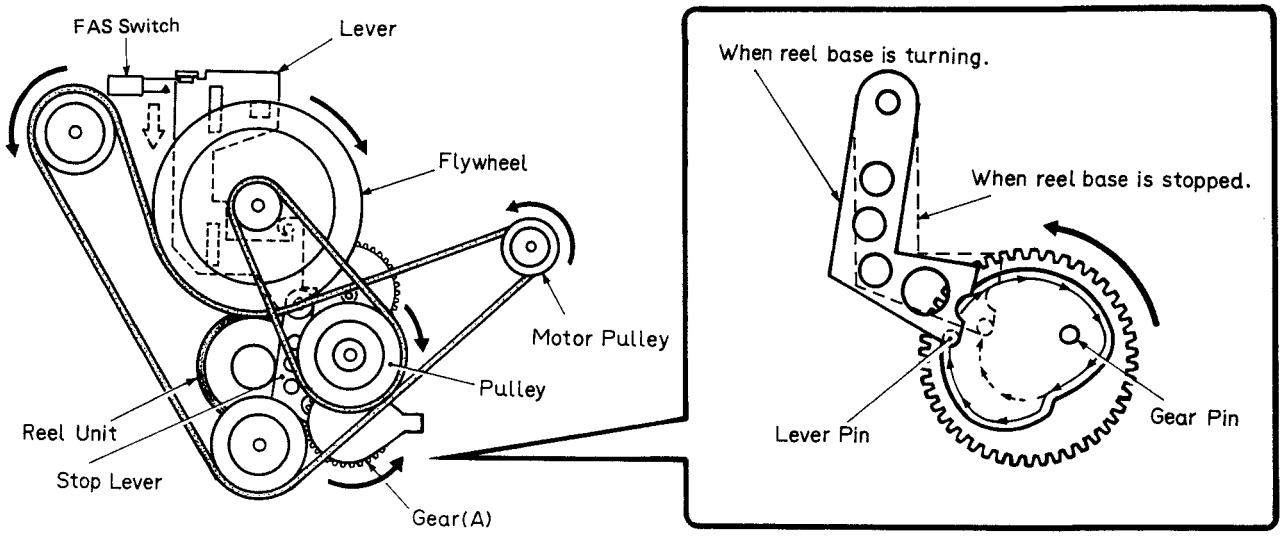


Fig. 30

1. The motor is driving the pulley and gear (A).
2. While the reel unit is rotating, the pin of the stop lever is pushed aside to the periphery of gear (A).
3. When the reel unit stops, the pin of the stop lever moves inward and catches in the pin of gear (A), which causes the stop lever to be pulled.
4. The stop lever pulls the adjacent lever. The lever in turn releases the pawl of the solenoid from the gear. The lever then turns the FAS switch on.
5. The gear turns to its "stop" position, turning the switches (those related) to their "stop" position, and withdrawing the head plate.

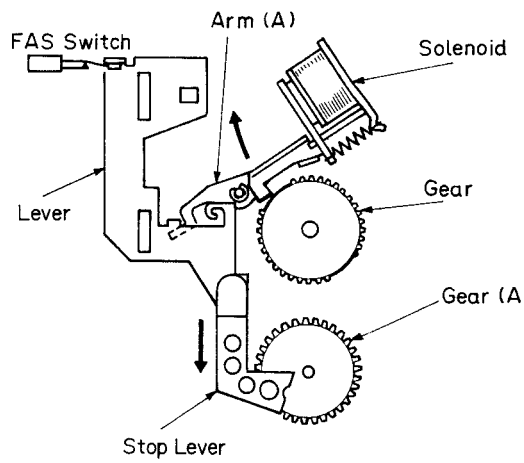


Fig. 31

4. DISASSEMBLY

• How to Remove the Rod Antenna

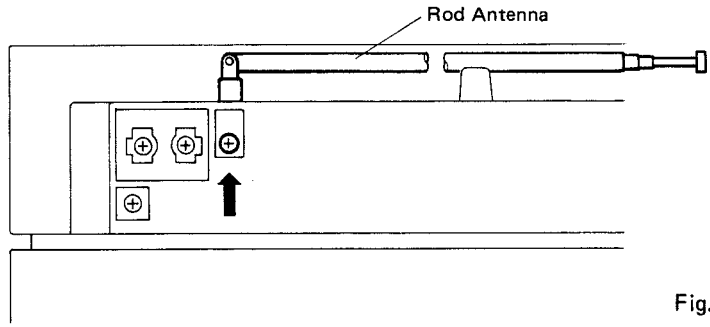


Fig. 32

1. The rod antenna can be removed without taking the top case off. Remove it by removing the screw indicated by the arrow.
2. When attaching the rod antenna, place it with the flat surface facing you and fix it with the screw.

• How to Remove the Case

Unlike older products, this product does not have screws going through the body from front to rear. Remove the top case assembly first, then the rear case, and finally the front case assembly.

• Removing the Top Case Assembly

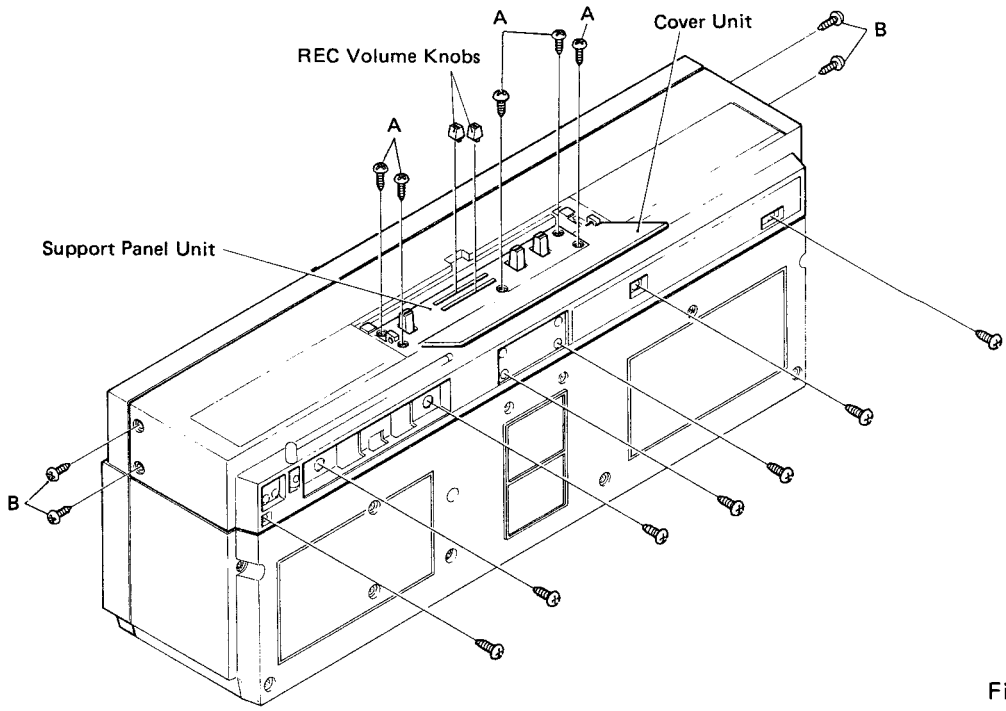


Fig. 33

1. Remove the four screws indicated by (B).
2. Open the cover unit and remove the REC volume knobs.
3. Remove the five screws indicated by (A), and remove the support panel unit and cover unit.
4. Remove the seven screws in the rear.
5. Set up the handle vertically and lift the top case. Disconnect the connectors inside the case (the connectors for the phono grounding terminal and antenna terminal) while removing the case.

• To Remove the the Rear Case

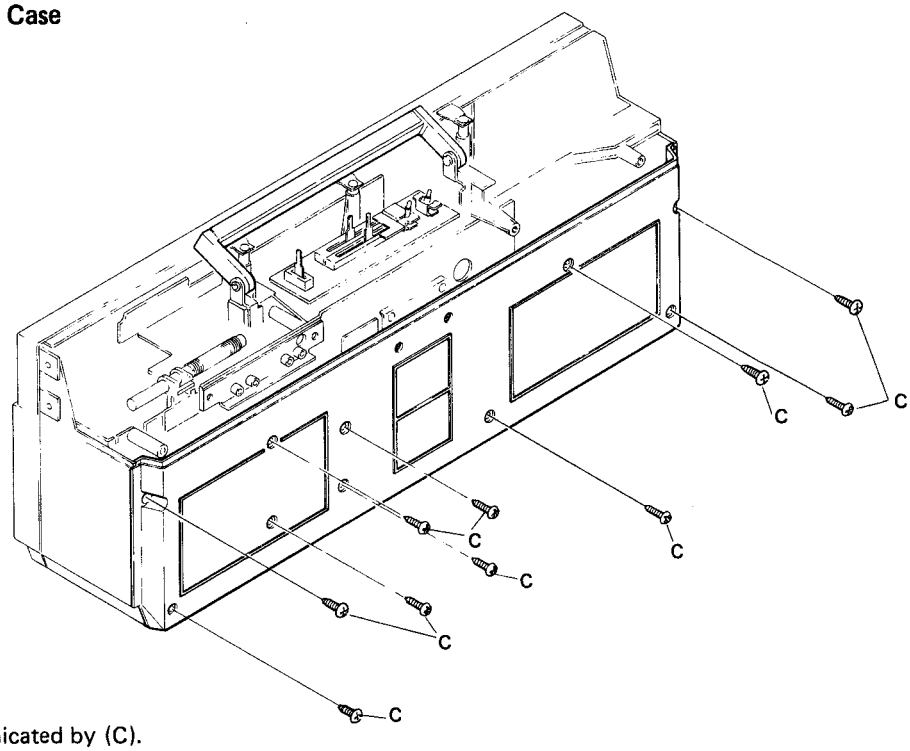


Fig. 34

1. Remove the ten screws indicated by (C).
2. Disconnect the connector for the ground terminal while removing the rear case.

• To Remove the Front Case

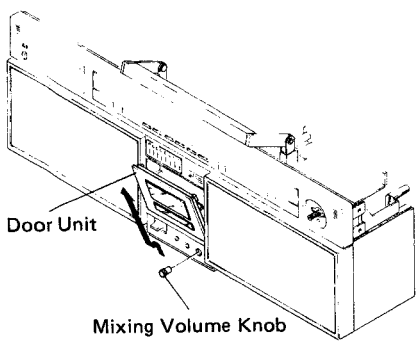


Fig. 35

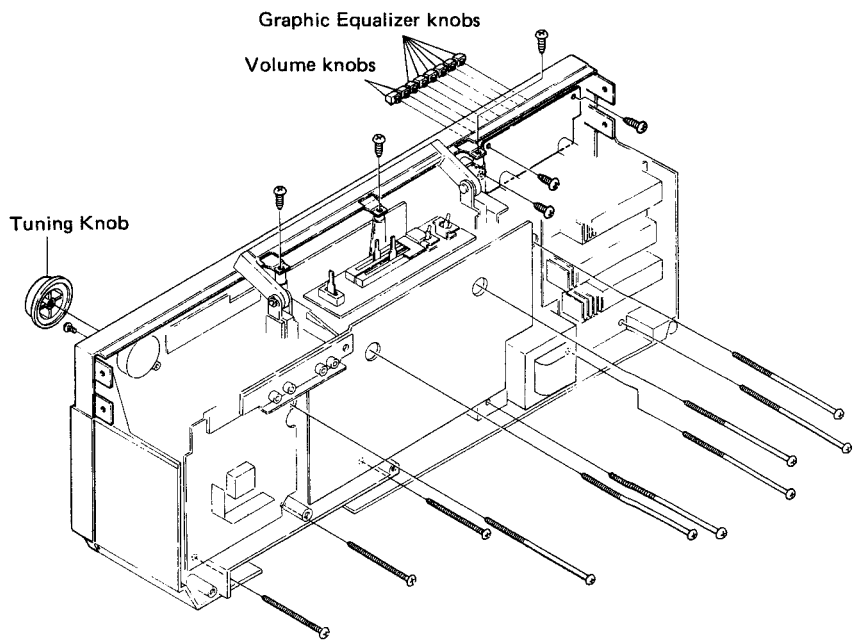


Fig. 36

1. Remove the door unit, mixing volume knob, tuning knob, volume knobs, and graphic equalizer knobs.
2. Remove the 17 screws, and remove the front case assembly.

- **To Remove the Cassette Mechanism Assembly**

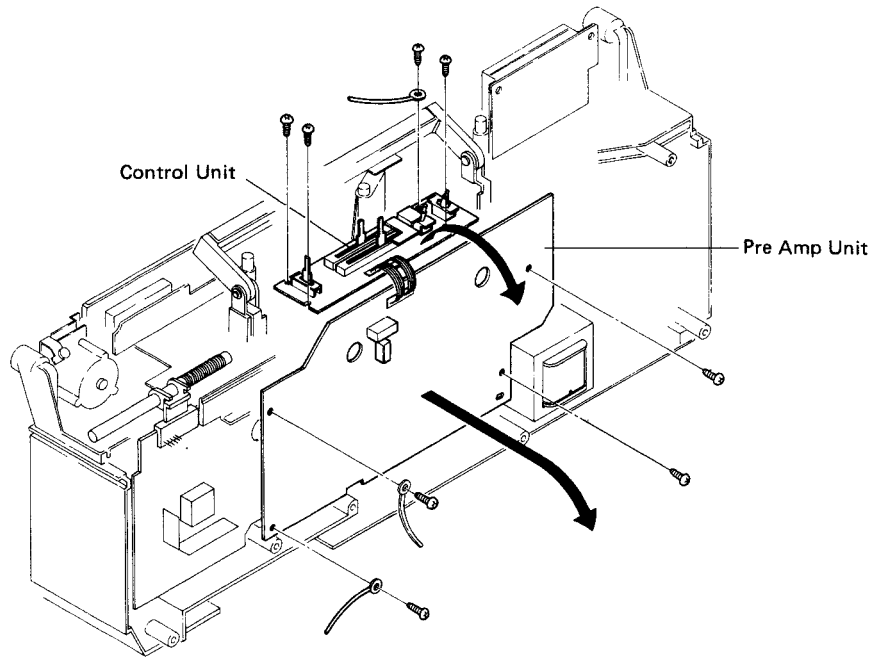


Fig. 37

1. Remove the four screws holding the control unit (Fig. 37).
2. Remove the four screws holding the pre-amplifier unit (Fig. 37).
3. Disconnect the connectors and remove each unit as indicated by the arrows (Fig. 37).

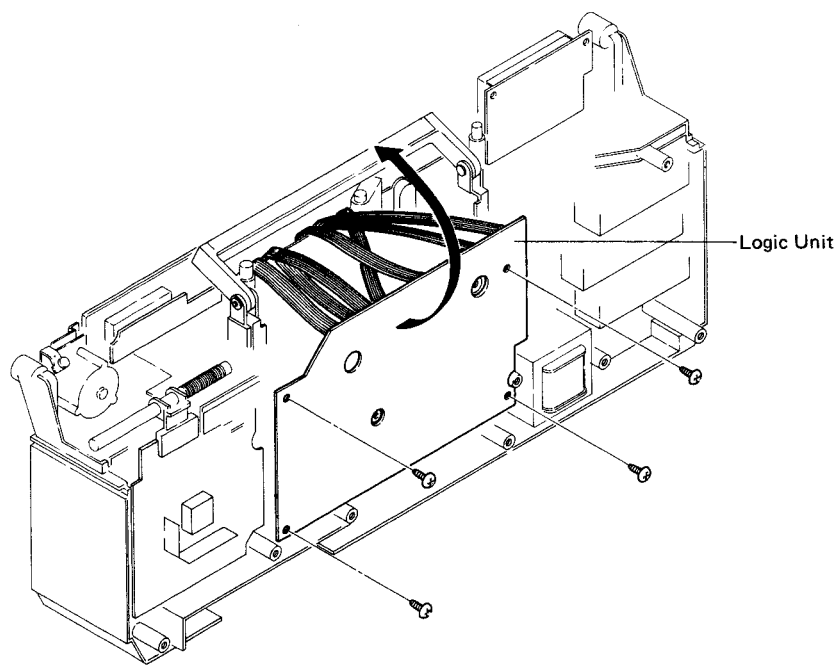


Fig. 38

4. Remove the four screws holding the logic unit (Fig. 38).
5. Disconnect the connectors, and relocate the unit in the manner indicated by the arrow (Fig. 38).

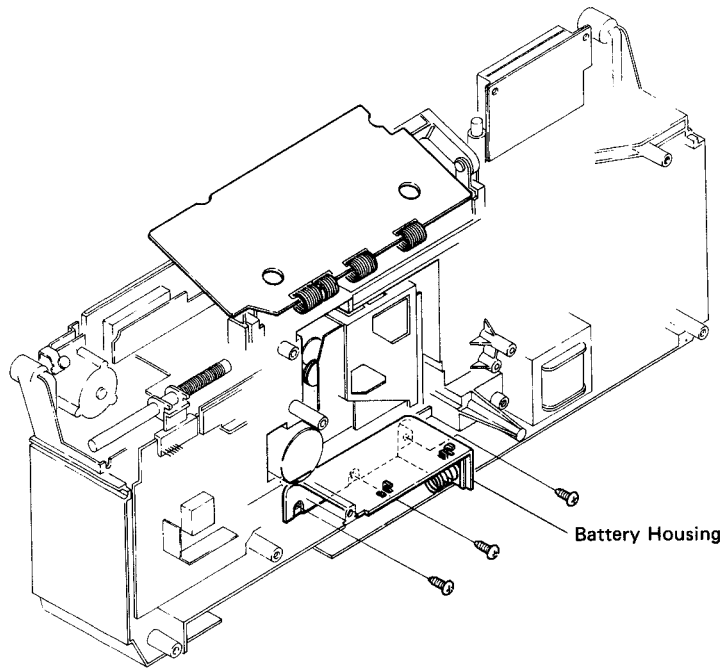


Fig. 39

6. Remove the three screws, and remove the battery housing (Fig. 39).

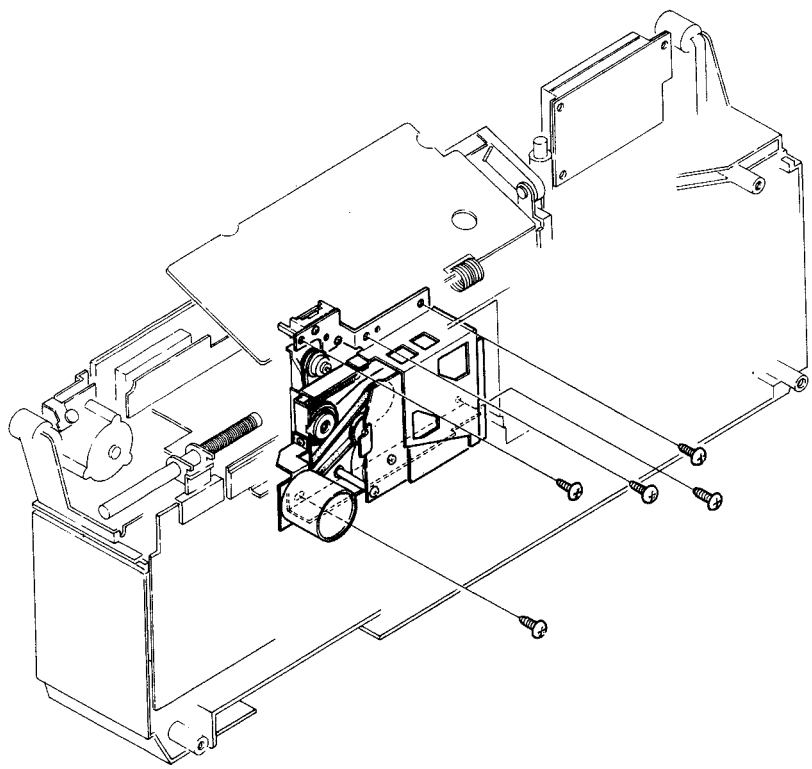
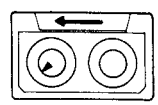
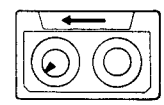
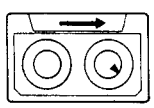
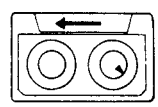
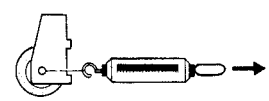


Fig. 40

7. Remove the five screws, and remove the cassette mechanism assembly (Fig. 40).

5. ADJUSTMENT

5.1 CHECK POINTS OF CASSETTE MECHANISM

<table>
<tr>
<td>Confirm the following items when replacing parts of the cassette mechanism.</td>
<td>■ Tape speed deviation:
3,000 ±75 Hz
(4.76 cm/s ±2.5%)
Using an STD-301A, measure the speed at the start and end of winding and take the maximum value. Measureing time shall be 5 ~ 6 seconds.</td>
<td>■ Wow and flutter:
Less than 0.25% (RMS)
Less than 0.15% (WRMS)
Using an STD-301A, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values.
Measuring time shall be 5 ~ 6 seconds.</td>
</tr>
<tr>
<td>■ Fast forward and rewinding time:
Less than 120 seconds
Using an C-60, set to fast forward and rewind, and measure the time with a stop watch.</td>
<td>■ Winding torque:
38 ~ 58 g.cm
 
Using a cassette type torque meter (120 g.cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.</td>
<td>■ F.F. torque:
85 ~ 150 g.cm
 
Using a cassette type torque meter (160 g.cm), measure the value when the tope stops in the F.F. mode.</td>
</tr>
<tr>
<td>■ REW torque:
85 ~ 150 g.cm
 
Using a cassette type torque meter (160 g.cm), measure the value when the tape stops in the REW mode.</td>
<td>■ Back tension torque:
2 ~ 5 g.cm
 
After setting in the REW mode wihtout loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.</td>
<td>■ Pinch roller pressure:
230 ~ 290 g
 
Measure the pressure with a tension meter (1 kg) at the point where the rotor stops rotating at the center of the pinch roller.</td>
</tr>
<tr>
<td>■ Lever operating force:
EJECT . . . . . Less than 2,300g</td>
<td>■ Clearance between flywheel and flywheel bracket:
0.05 ~ 0.25 mm</td>
<td></td>
</tr>
</table>

5.2 HEAD AZIMUTH ADJUSTMENT

- **Connection Diagram**

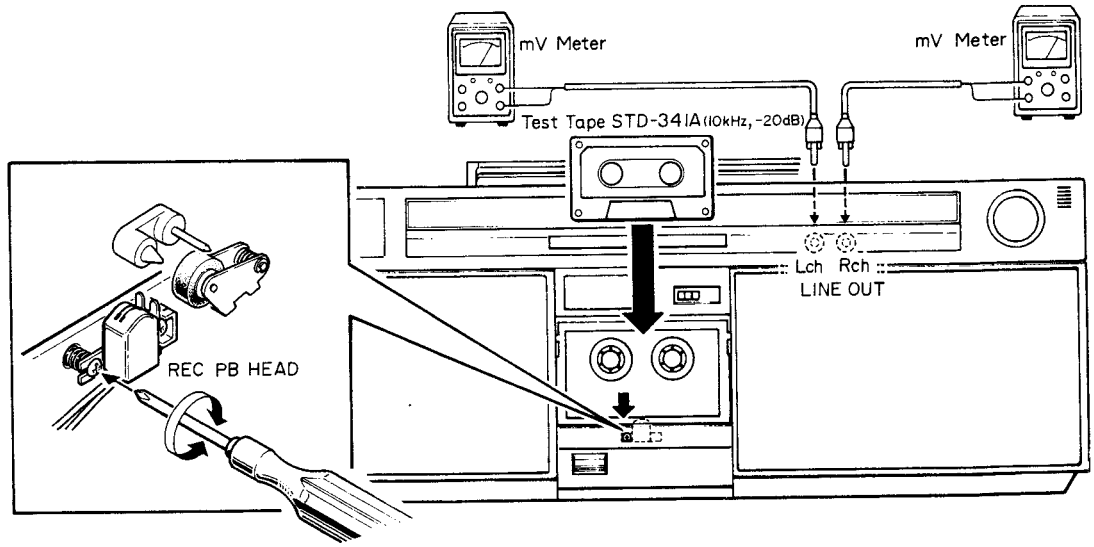


Fig. 41

- **To Adjust**

1. Remove the cassette holder door.
2. Playback the STD-341A (10 kHz, –20 dB) test tape.
3. Turn head azimuth alignment screw until mV meter pointer indicates maximum reading for both left and right channels.
4. Lock screw with adhesive (GYL-001) after adjustment is made.

5.3 RECORD BIAS ADJUSTMENT

- **Connection Diagram**

Switch positions

BFC 1
TAPE POSITION . . . . . METAL

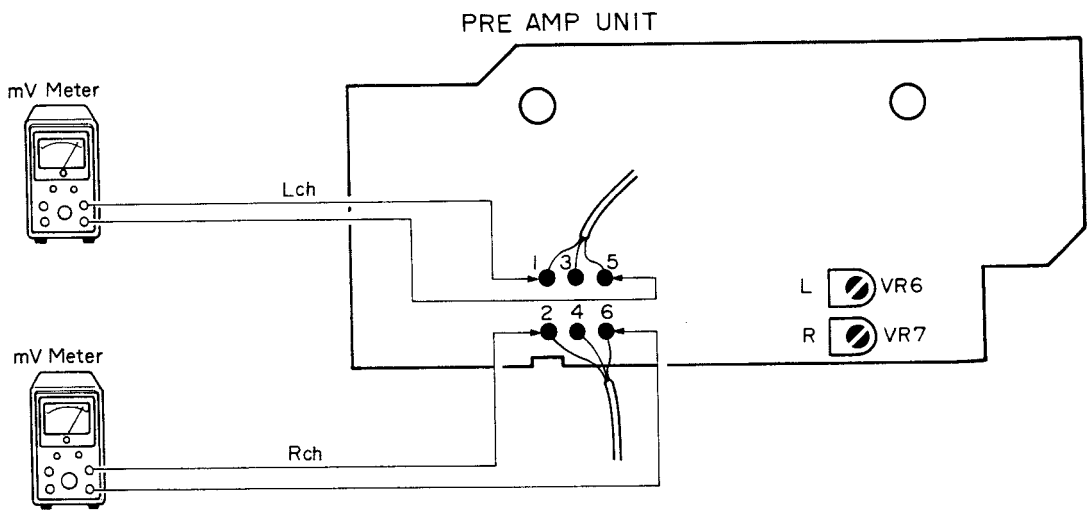


Fig. 42

- **To Adjust**

1. Put the unit into the record mode.
2. Adjust VR6 (L channel) and VR7 (R ch.) so that the millivoltmeters read 7.3 mV.

5.4 TRAPPING ADJUSTMENT

- **Connection Diagram**

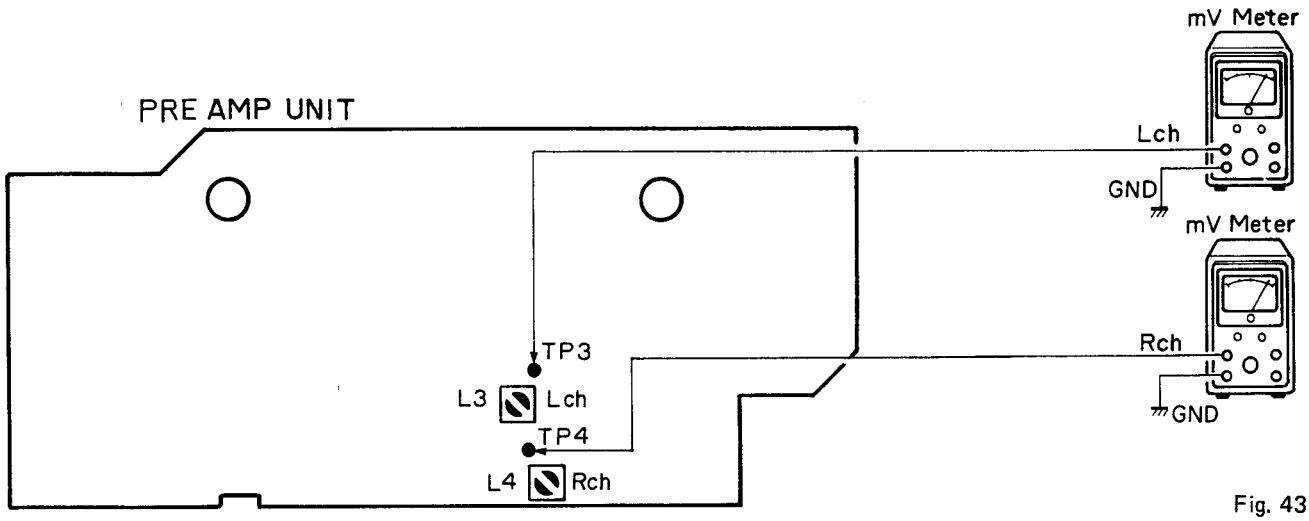


Fig. 43

- **To Adjust**

1. Put the unit into the record mode.
2. Turn the BFC switch to position "1." Adjust L3 (L ch.) and L4 (R ch.) so that the millivoltmeters show the smallest deflection.
3. Turn the BFC switch to position "2" and repeat the adjustment in item 2.
4. Adjust L3 and L4 so that the meters read the same in switch positions "1" and "2."

5.5 DOLBY NR PLAYBACK ADJUSTMENT

- **Connection Diagram**

Switch positions
TAPE POSITION ..... NORM
DOLBY NR ..... OFF

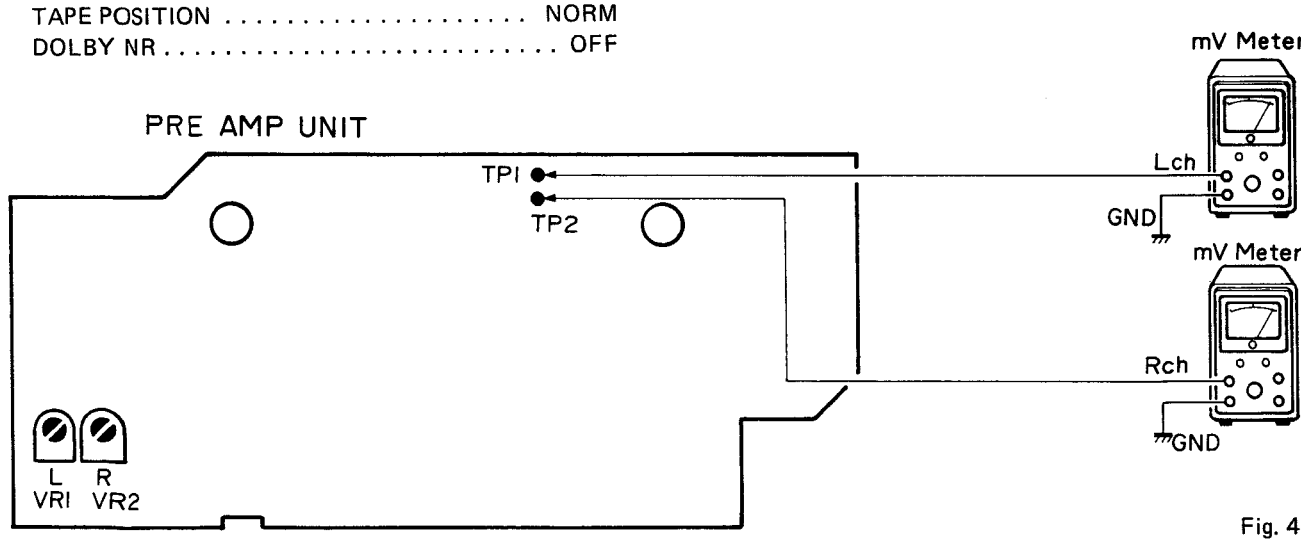


Fig. 44

- **To Adjust**

1. Playback the CT-150 (400Hz, 200nwb/m) test tape, and adjust VR1 (L ch.) and VR2 (R ch.) so that the millivoltmeters read 775 mV (0 dBs).

5.6 DOLBY NR CHARACTERISTICS ADJUSTMENT

- **Connection Diagram**

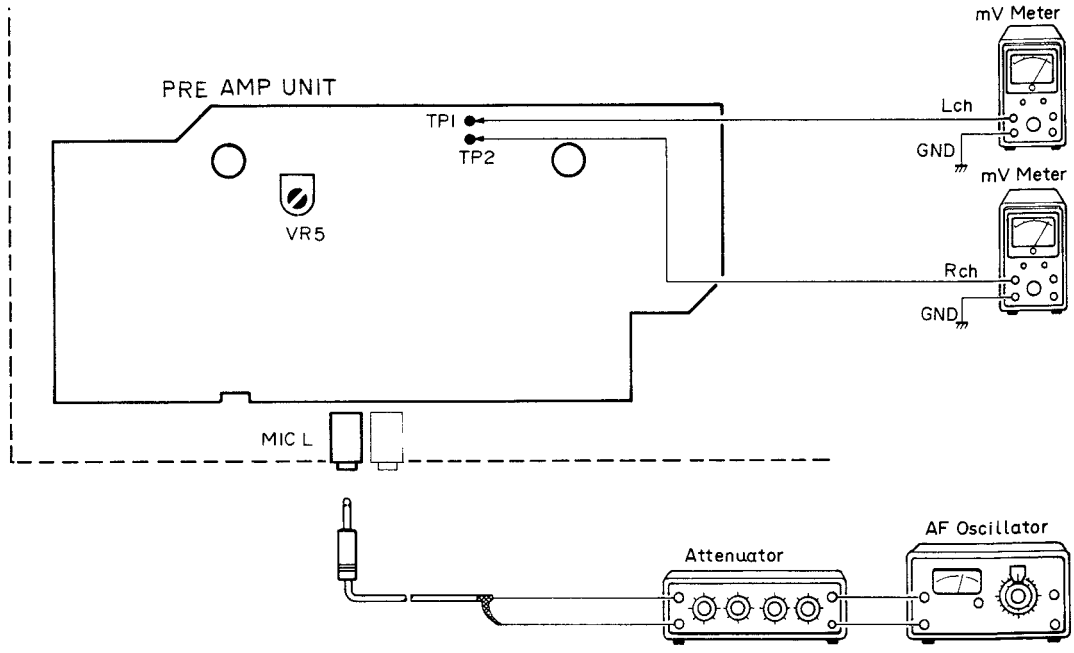


Fig. 45

- **To Adjust**

1. Turn off the Dolby noise reduction switch.
2. Input a 5 kHz signal into the microphone jack (L ch.). Adjust the attenuator (external) and the mixing volume so that the millivoltmeter reads 59mV (–22.4 dBs).
3. Turn the Dolby noise reduction switch on. Then adjust VR5 so that the millivoltmeter reads 23.4mV (–30.4 dBs).

5.7 RECORDING AND PLAYBACK LEVEL ADJUSTMENT

• Connection Diagram

Switch positions

TAPE POSITION ..... NORM
DOLBY NR ..... OFF
BFC 1
REC MODE ..... MANUAL
PHONO/AUX ..... AUX

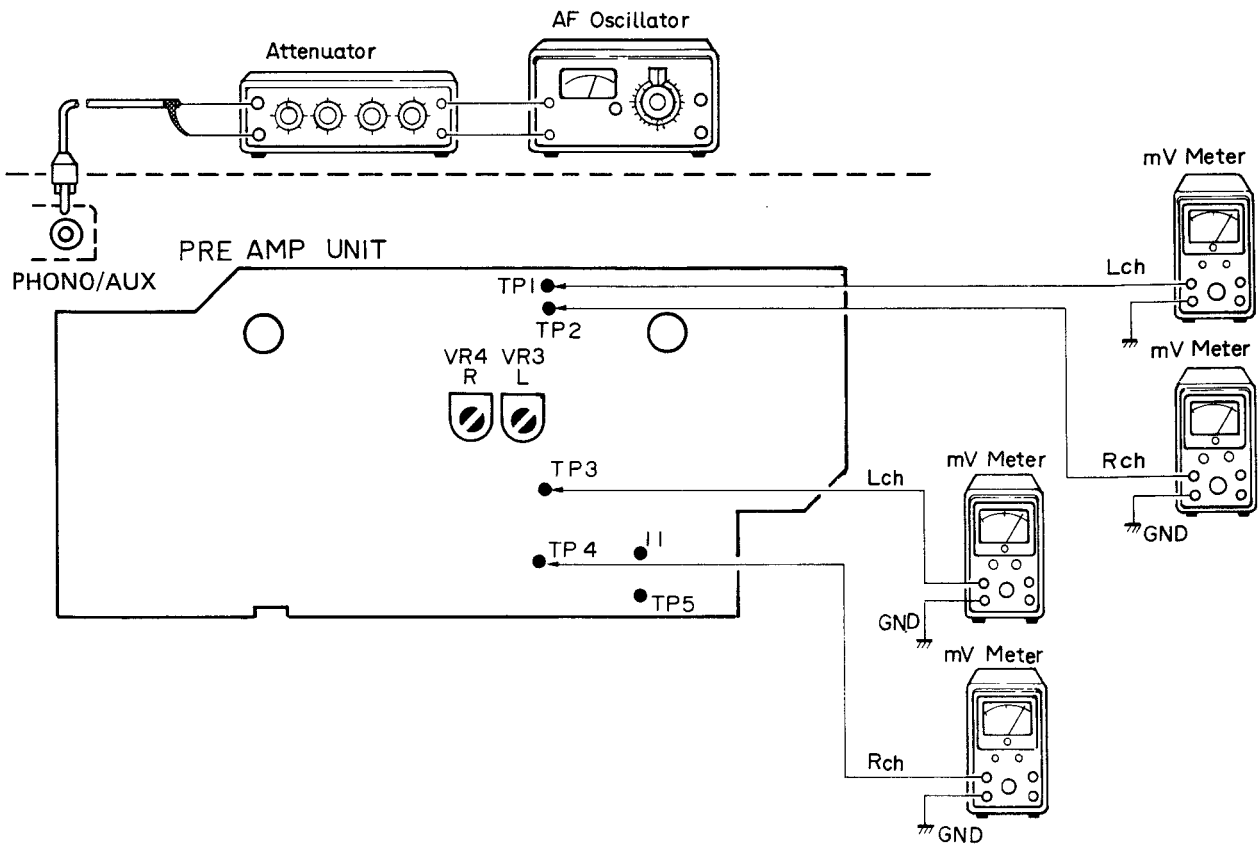


Fig. 46

• To Adjust

1. Input a signal of 400 Hz, −10 dBs into the AUX terminal, and record the signal on a blank tape.
2. Adjust the record volume so that the millivoltmeters connected to TP1 and TP2 read 0 dBs.
3. Playback the recorded tape, and make sure that the millivoltmeter reads within ±1 dB of 0 dBs.
4. If the readings are out of that range, do the following:
5. Repeat items 1 and 2. Then connect TP5 and pin 11.
6. Watching the millivoltmeters connected to TP3 (L ch.) and TP4 (R ch.), adjust VR3 (L ch.) and VR4 (R ch.) to compensate for the deviation from 0 dBs measured in item 3. When the deviation is positive, turn the semi-fixed resistor counterclockwise. When the deviation is negative, turn it clockwise.
7. Repeat items through 3 to make sure the readings are within ±1 dB of 0 dBs.

5.8 AM IF ADJUSTMENT

- **Connection Diagram**

IF Generator Scope

Sweep center frequency 455kHz
Input gain 0.3Vp-p/cm

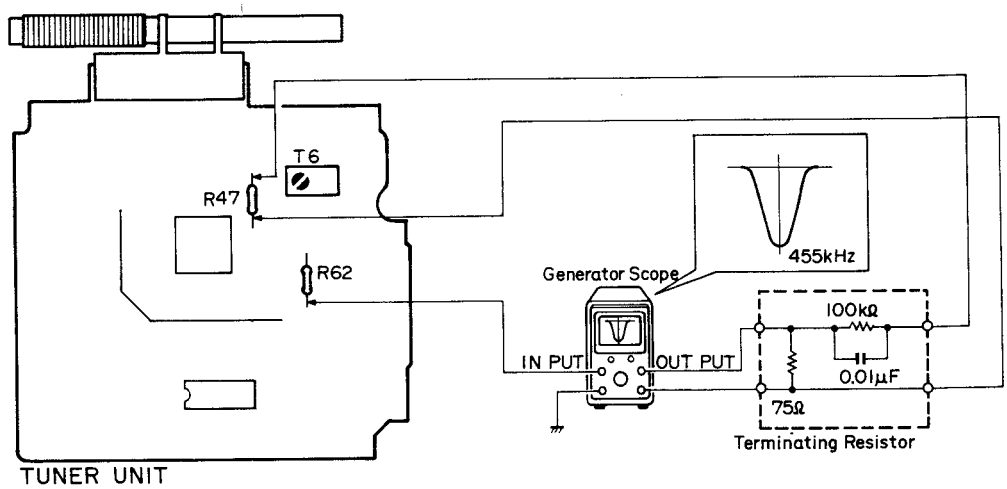


Fig. 47

- **To Adjust**

1. Apply minimum output signal required to check generator scope U curve and adjust T6 so that curve amplitude is at maximum point and there is optimum symmetry.

5.9 AM TRACKING ADJUSTMENT

- **Connection Diagram**
- **Preparation**

Emit radio waves from an AM SSG using coil antenna as shown in illustration.

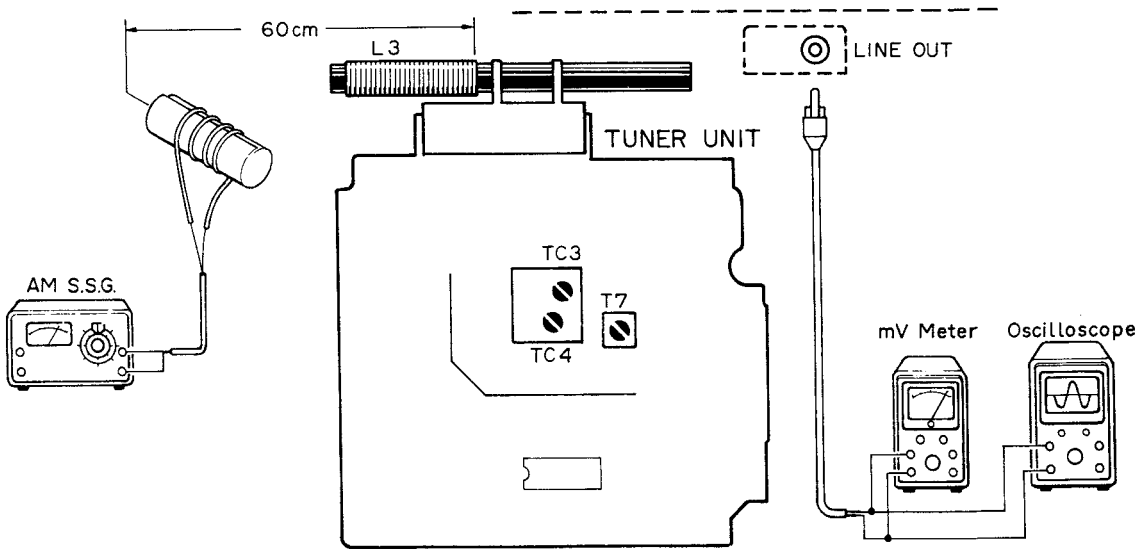


Fig. 48

- **To Adjust**

	Frequency of AM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1.	515 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T7	515 kHz can be received.
2.	1,650 kHz (400 Hz. 30% modulation) output level 60 dB/m.	Minimum (turn the tuning knob clockwise until high end.)	TC4	1,650 kHz can be received.
3.	Repeat (1) and (2) alternately and adjust so that 515 ~ 1,650 kHz are covered.			
4.	600 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 600 kHz.	L3 (Coil of bar antenna)	Maximum output.
5.	1,400 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 1,400 kHz.	TC3	Maximum output.
6.	Repeat (4) and (5) alternately and confirm that tuning pointer indication is correct.			

Note: After adjusting L3 (Coil of bar antenna), melt electro wax with soldering iron and fix it in position.

5.10 FM IF ADJUSTMENT

- **Connection Diagram**

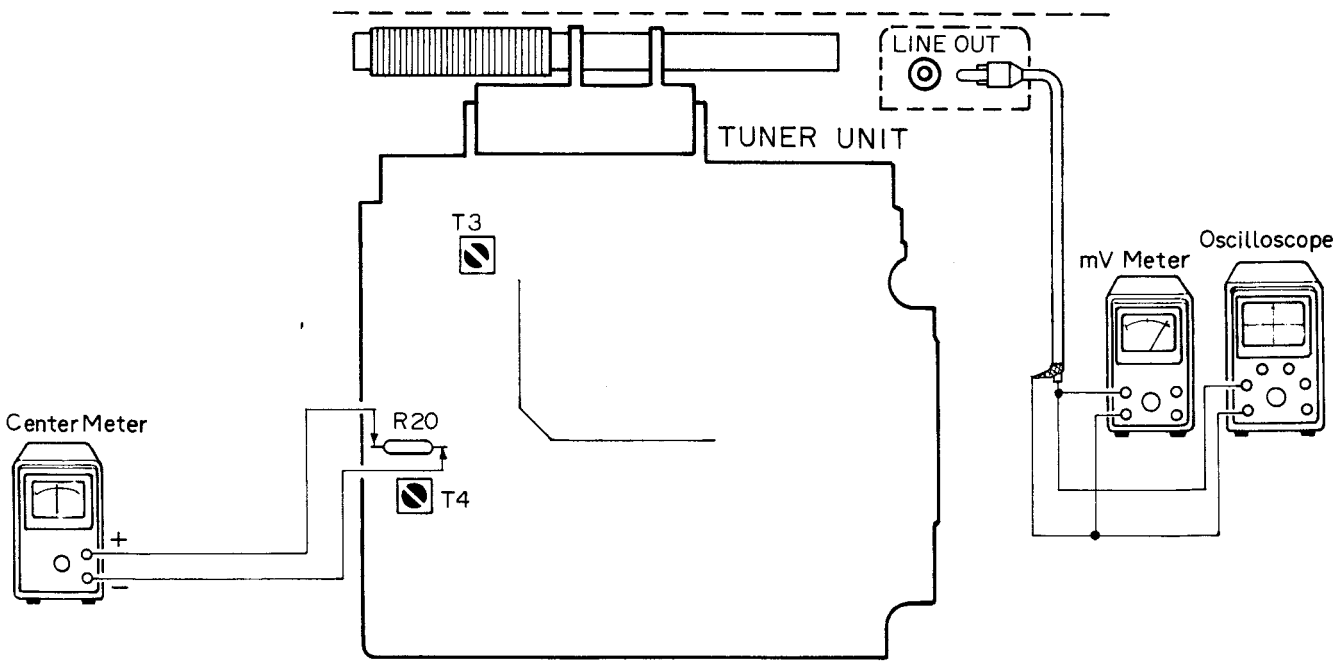


Fig. 49

- **To Adjust**

1. Adjust T3 so that noise level is highest at white noise.
2. Adjust T4 so that the center meter points to the center.

5.11 FM TRACKING ADJUSTMENT

- **Connection Diagram**

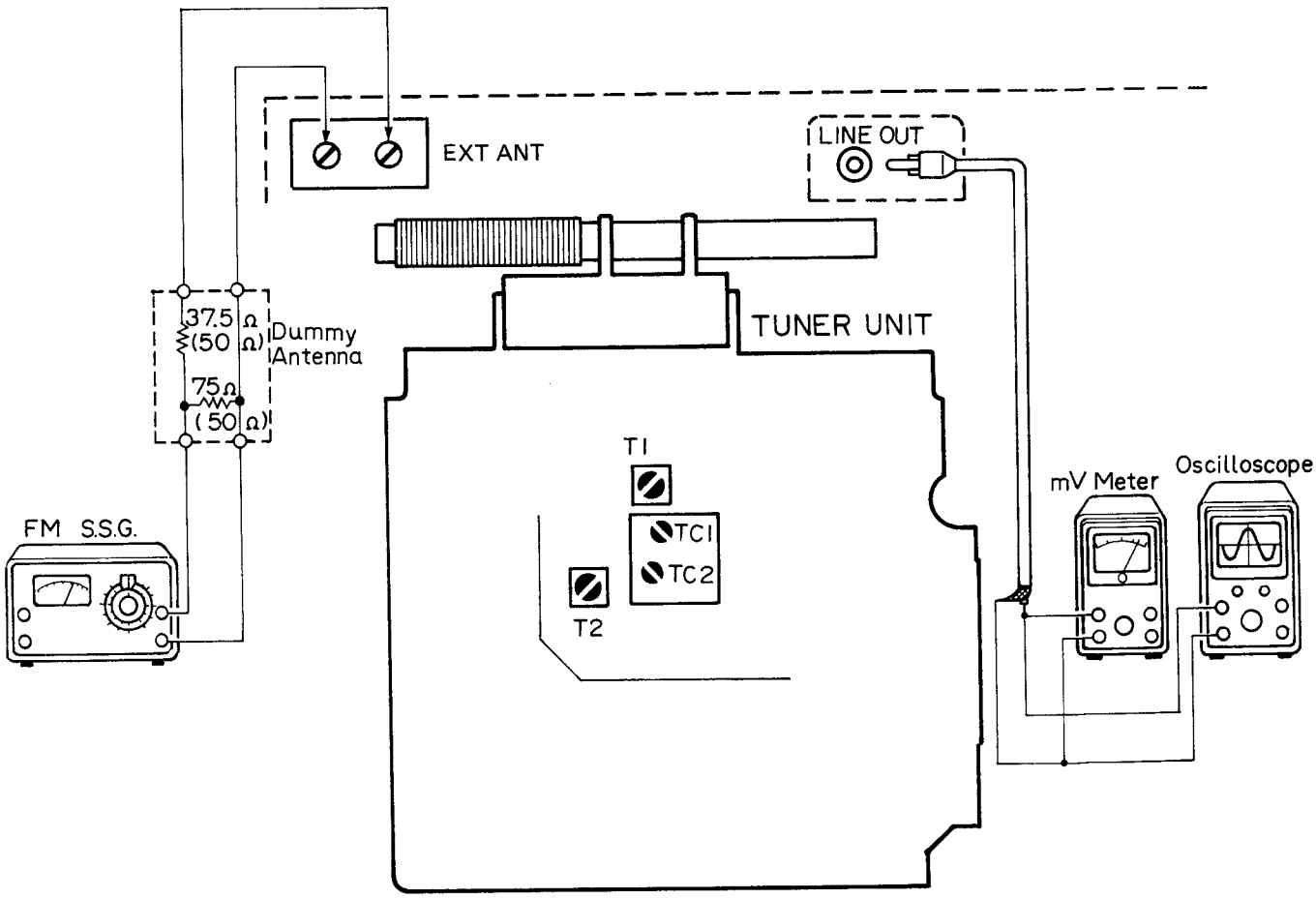


Fig. 50

- **To Adjut**

	Frequency of FM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1.	87 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Maximum (turn the tuning knob counterclockwise until low end.)	T2	87 MHz can be received.
2.	109.5 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Minimum (turn the tuning knob clockwise until high end.)	TC2	109.5 MHz can be received.
3.	Repeat (1) and (2) alternately and adjust so that 87 ~ 109.5 MHz are received.			
4.	90 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 90 MHz.	T1	Maximum output
5.	106 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 106 MHz.	TC 1	Maximum output
6.	Repeat (4) and (5) alternately and adjust until tracking error disappears.			

5.12 FM IF FINAL ADJUSTMENT

- **Connection Diagram**

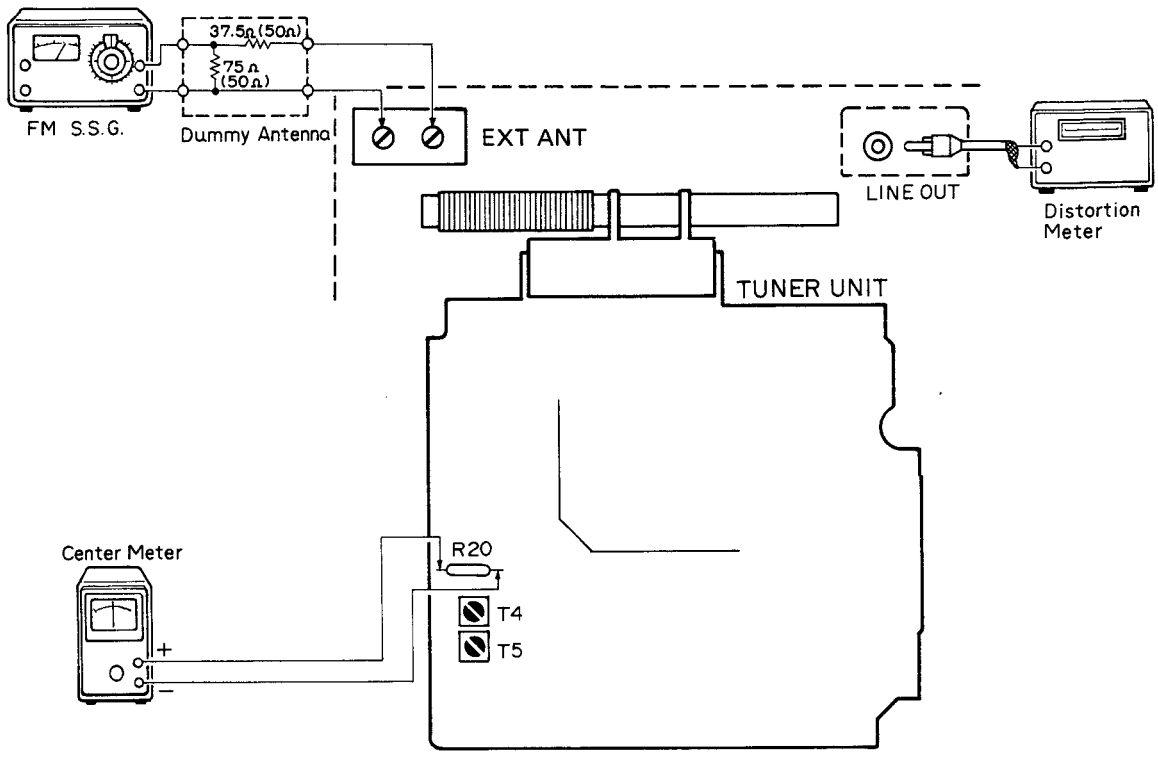


Fig. 51

- **To Adjust**

1. Adjust T4 so that the center meter points to the center when there is no signal.
2. Apply a signal of 82 MHz, 66 dB(μV) from the FM SSG and tune the tuner to the signal.
3. Adjust T5 so that distortion becomes minimum.
4. Turning T5 changes the center meter reading, and turning T4 changes the distortion value. Repeat items 1 and 3 to obtain the optimum result.

5.13 FM MPX ADJUSTMENT

- **Connection Diagram**

Stereo Modulator

Modulation frequency 1kHz
Modulation ratio 100%
Pilot signal . . . . . 7.5kHz deviation
Main signal . . . . . 67.5kHz deviation

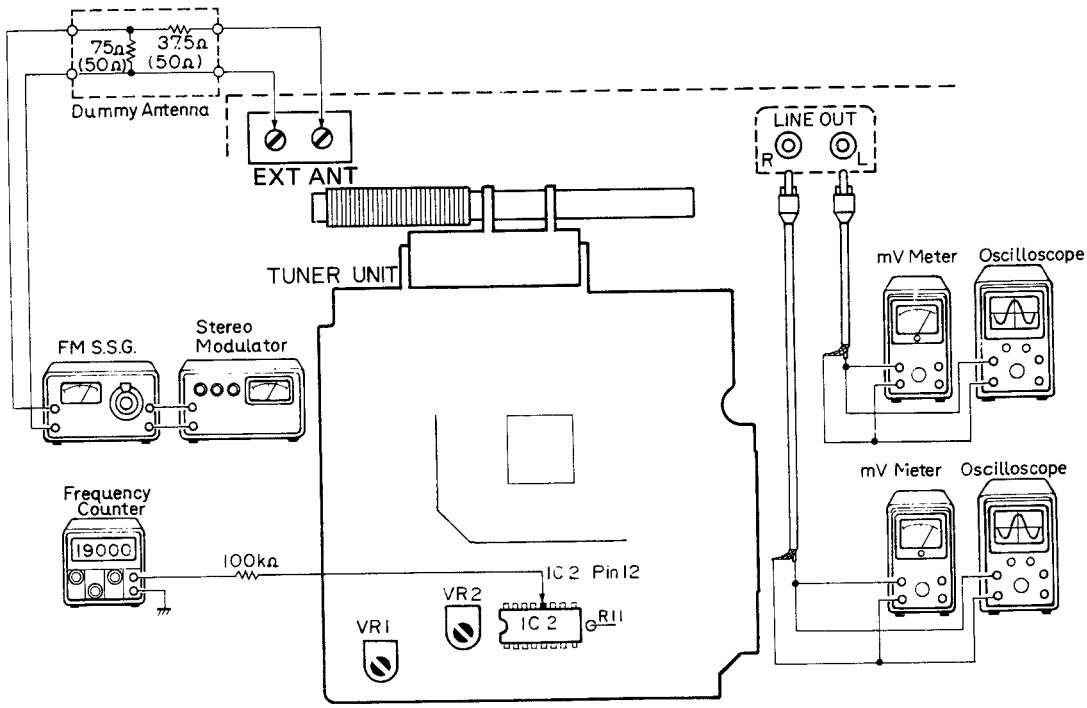


Fig. 52

- **To Adjust**

1. Apply a signal of 82 MHz, 10dB from the FM SSG, and tune the tuner to the signal.
2. Set the output of the FM SSG to 60 dB, and turn the modulation off.
3. Adjust VR2 so that the counter indicates within ±20 Hz of 19 kHz.
4. Check the separation. If the separation is not less than 25dB cut the body of R11.
5. Set the output of the FM SSG to 26 dB. Then adjust VR1 so that the tuning indicator (green) lights.

6. DIAL STRINGING

1. Install the tuning string as shown in the illustrations in Fig. 54. (Follow the numbers.)
2. Facing the unit from behind, turn the variable capacitor drum all the way to the right.
3. When joining the variable capacitor drum and variable capacitor bush, turn the variable capacitor drum back by 10 to 20 degrees.

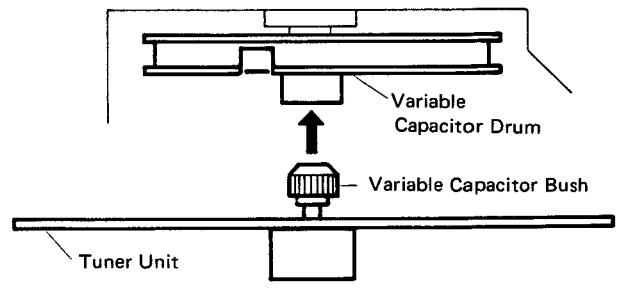


Fig. 53

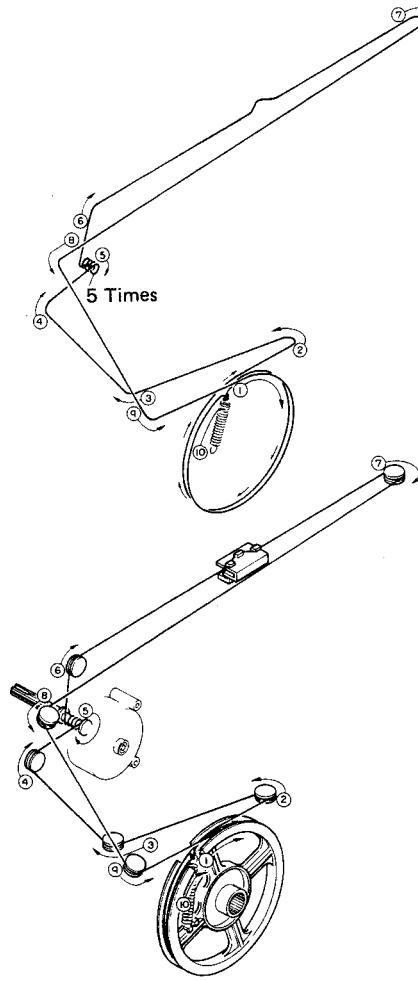
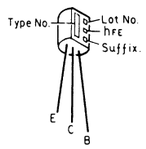


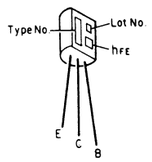
Fig. 54

• ICs and Transistors

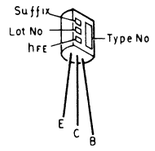
2SA733
2SC1675



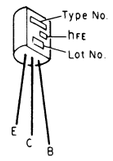
2SC380TM
2SC732TM



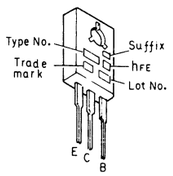
2SC2320
2SC2320L



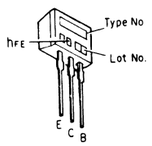
2SB562
2SC468



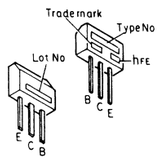
2SC2209



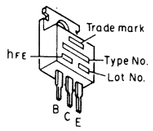
2SC2786
2SC2787



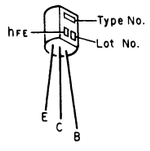
2SC461



2SC1173



2SA934
2SC2060



2SA1015
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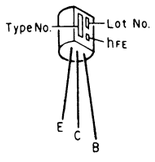
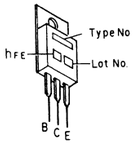
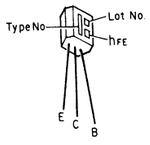
2SC1674
2SC1815



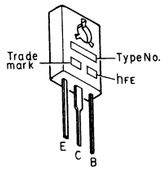
2SB825



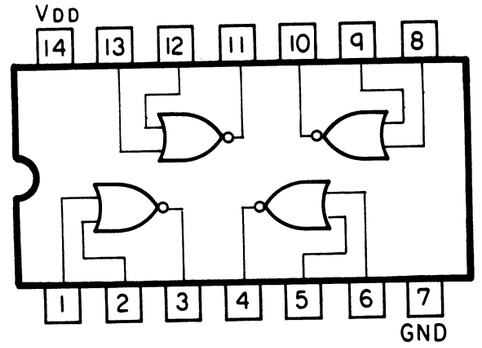
2SD1012



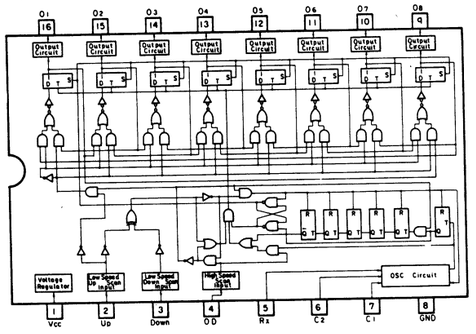
2SA715



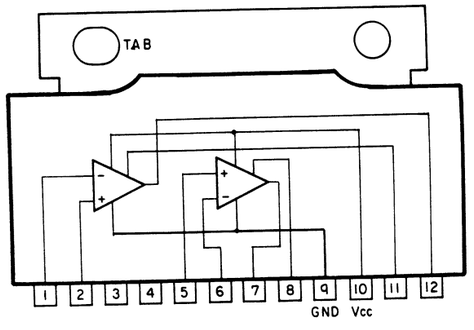
MSM4001RS



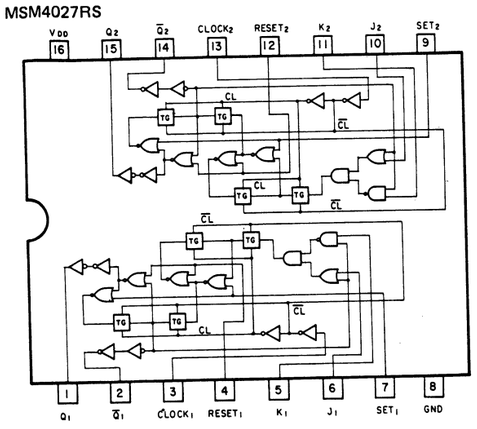
M54832P



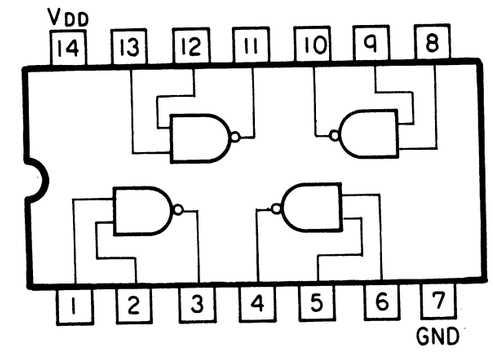
HA1392P



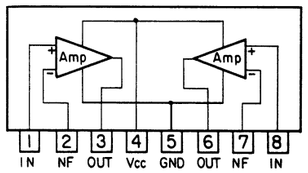
MSM4027RS



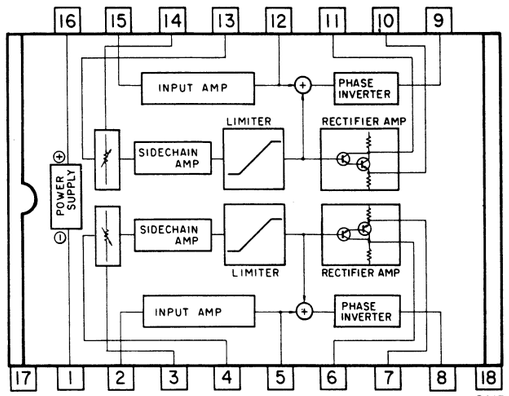
MSM4011RS



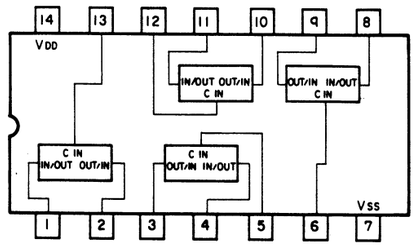
M51521L



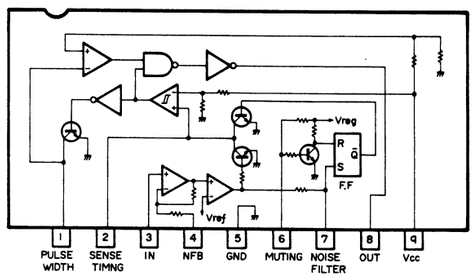
HA11226



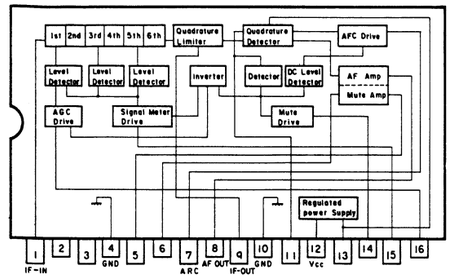
TC4066P
μPD4066C



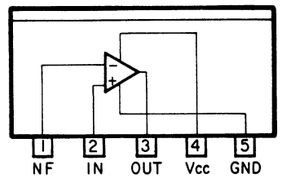
BA336



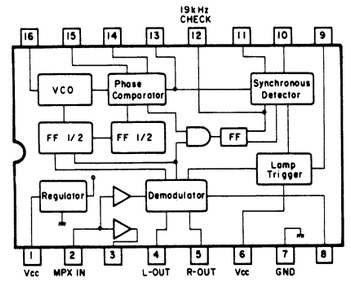
LA1140



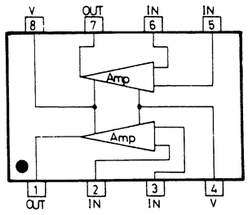
M51204L



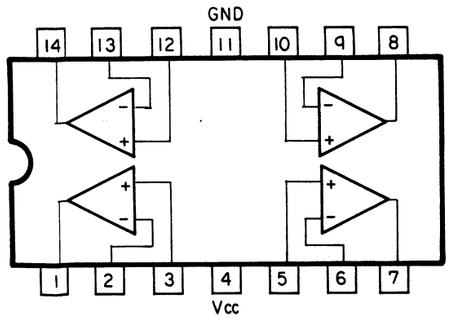
LA3361



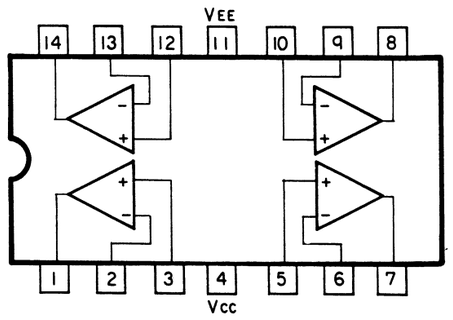
TA7558P
μPC4558C
NJM4558DD



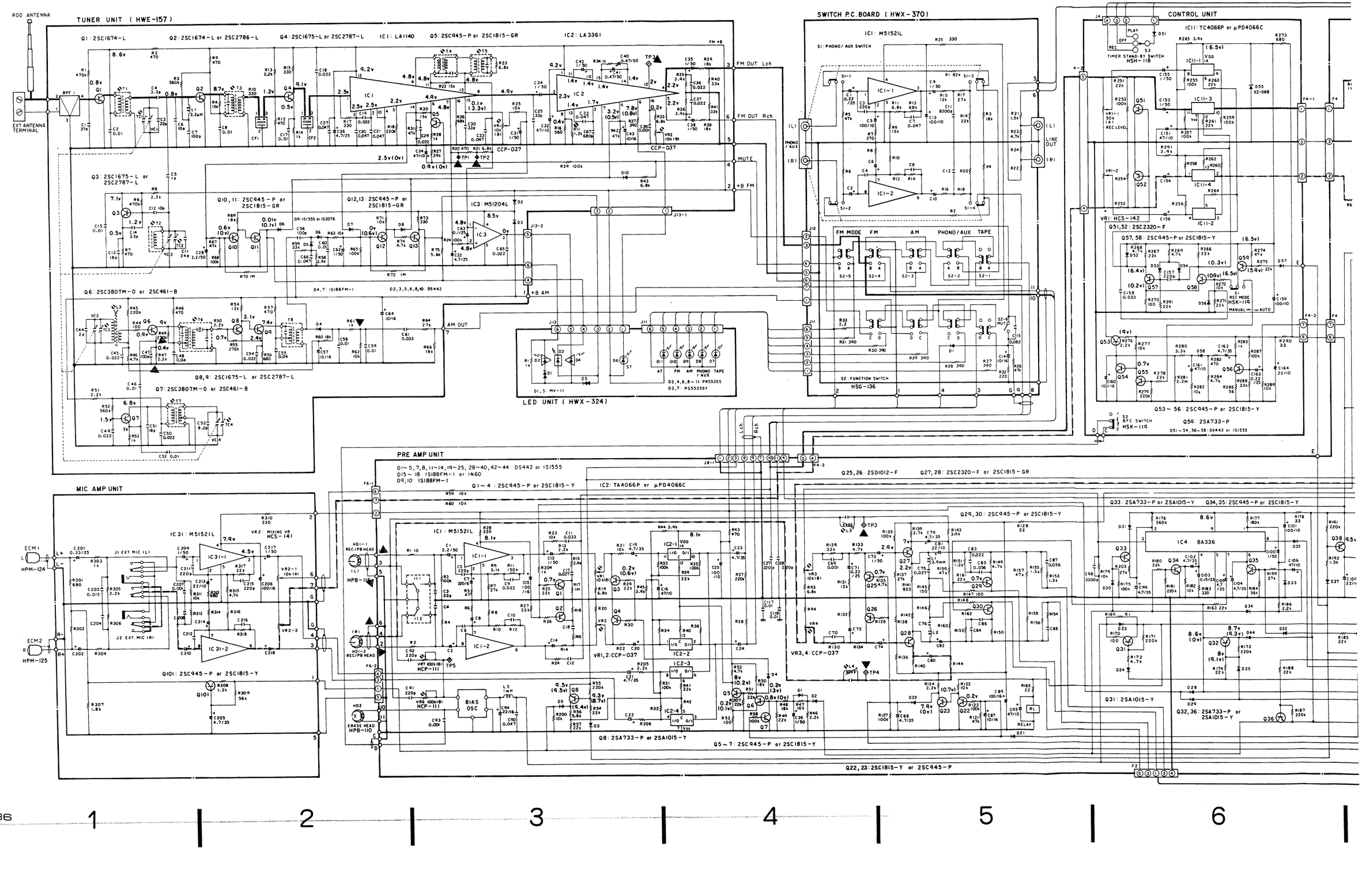
NJM2902N



TA75902P



7. SCHEMATIC CIRCUIT DIAGRAM

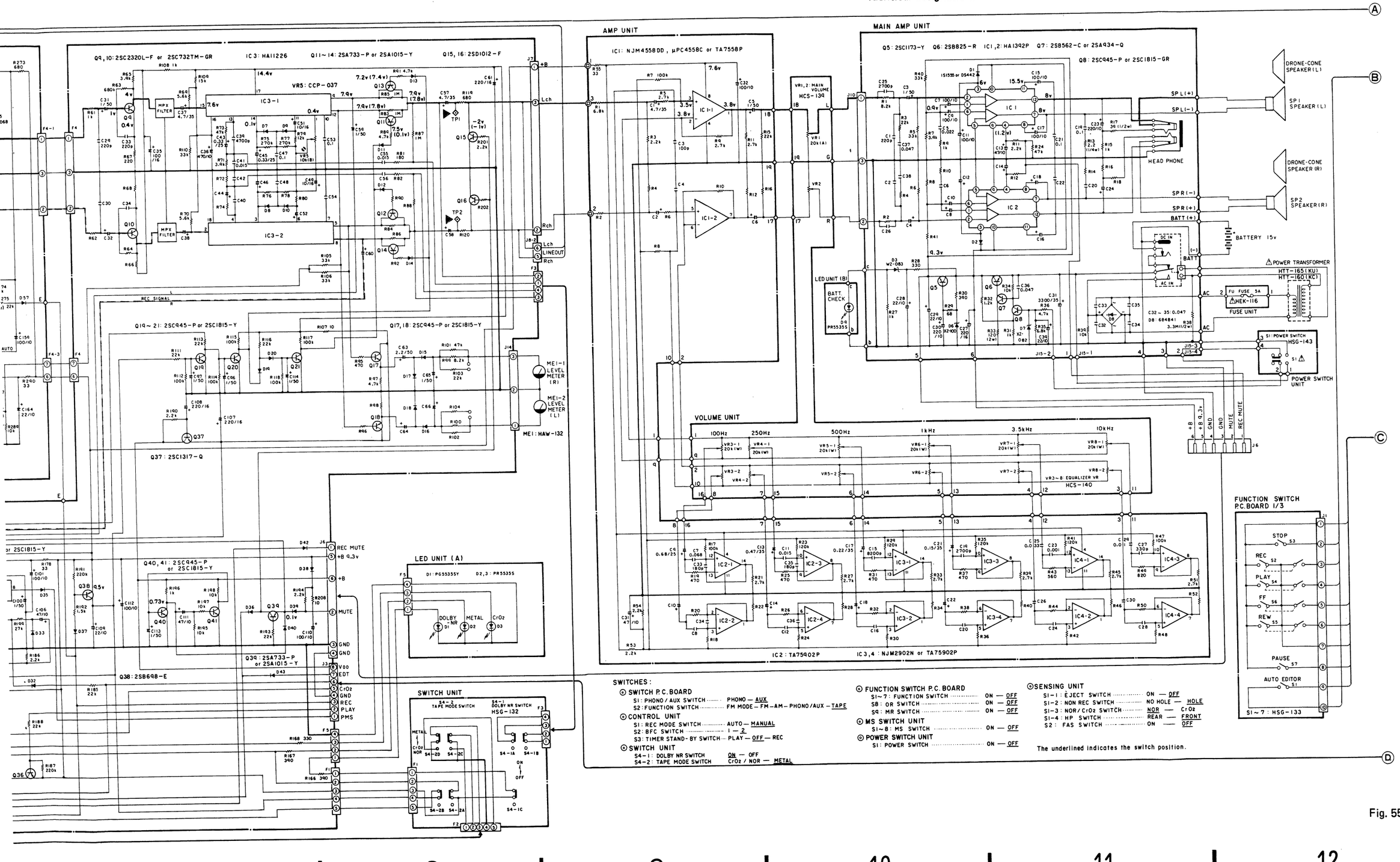


7 8 9 10 11 12

A B C D

PLAY MODE
REC MODE

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*



SWITCHES:

⊙ SWITCH P.C.BOARD
- S1: PHONO / AUX SWITCH ..... PHONO — AUX
- S2: FUNCTION SWITCH ..... FM MODE — FM — AM — PHONO/AUX — TAPE

⊙ CONTROL UNIT
- S1: REC MODE SWITCH ..... AUTO — MANUAL
- S2: BFC SWITCH ..... 1 — 2
- S3: TIMER STAND-BY SWITCH ..... PLAY — OFF — REC

⊙ SWITCH UNIT
- S4-1: DOLBY NR SWITCH ..... ON — OFF
- S4-2: TAPE MODE SWITCH ..... CrO2 / NOR — METAL

⊙ FUNCTION SWITCH P.C.BOARD
- S1~7: FUNCTION SWITCH ..... ON — OFF
- S8: OR SWITCH ..... ON — OFF
- S9: MR SWITCH ..... ON — OFF

⊙ MS SWITCH UNIT
- S1~8: MS SWITCH ..... ON — OFF

⊙ POWER SWITCH UNIT
- S1: POWER SWITCH ..... ON — OFF

⊙ SENSING UNIT
- S1-1: EJECT SWITCH ..... ON — OFF
- S1-2: NON REC SWITCH ..... NO HOLE — HOLE
- S1-3: NOR / CrO2 SWITCH ..... NOR — CrO2
- S1-4: HP SWITCH ..... REAR — FRONT
- S2: FAS SWITCH ..... ON — OFF

The underlined indicates the switch position.

Fig. 55

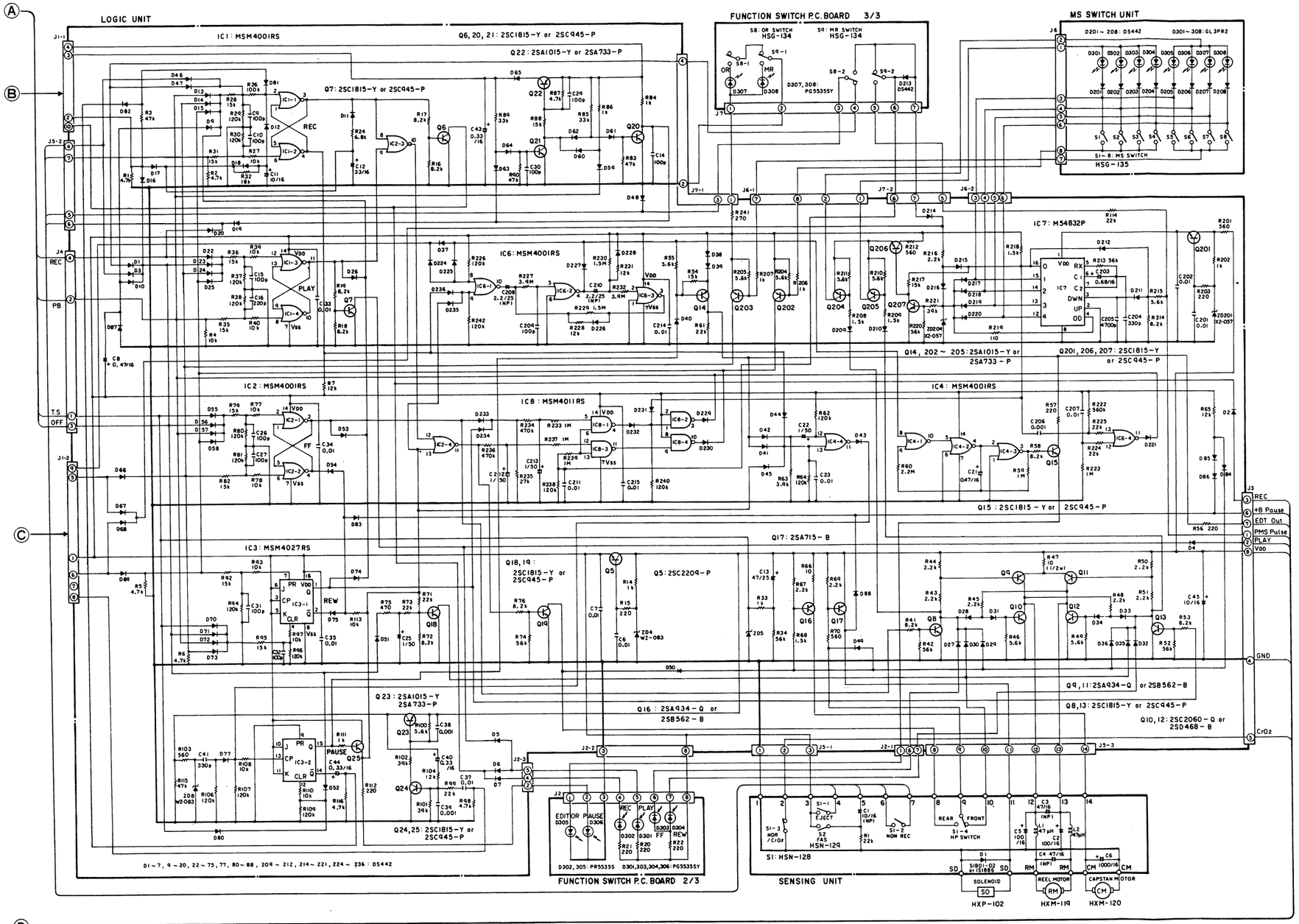
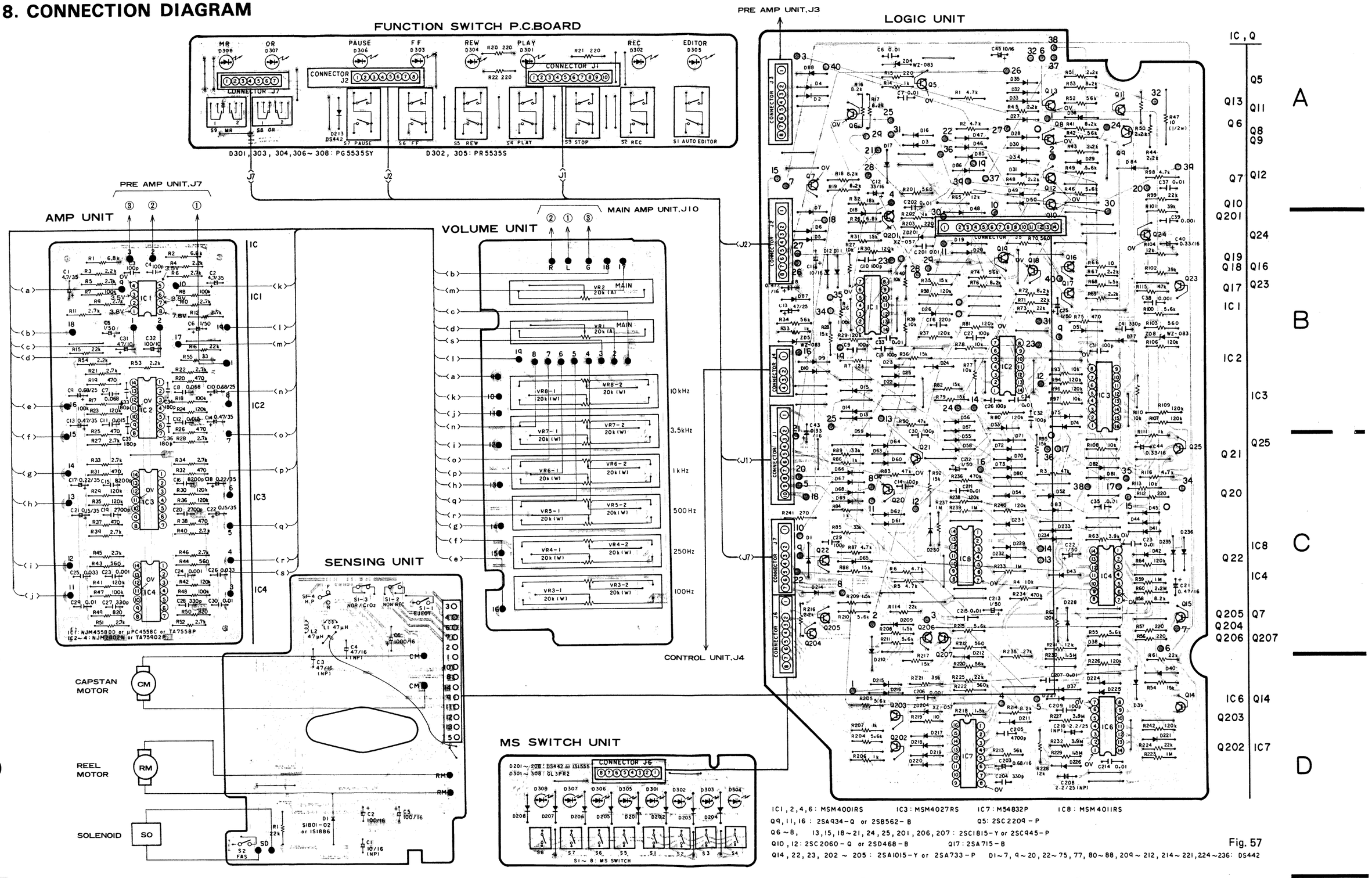

LOGIC UNIT
IC1: MSM4001RS
Q6, 20, 21: 2SC1815-Y or 2SC945-P
Q22: 2SA1015-Y or 2SA733-P
Q7: 2SC1815-Y or 2SC945-P
FUNCTION SWITCH P.C.BOARD 3/3
S8: OR SWITCH HSG-134
S9: MR SWITCH HSG-134
MS SWITCH UNIT
D201~208: DS442
D301~308: GL3PR2
S1~8: MS SWITCH HSG-135
IC7: M54832P
IC6: MSM4001RS
IC2: MSM4001RS
IC8: MSM4011RS
IC4: MSM4001RS
IC3: MSM4027RS
Q14, 202~205: 2SA1015-Y or 2SA733-P
Q201, 206, 207: 2SC1815-Y or 2SC945-P
Q15: 2SC1815-Y or 2SC945-P
Q17: 2SA715-B
Q18, 19: 2SC1815-Y or 2SC945-P
Q5: 2SC2209-P
Q16: 2SA934-Q or 2SB562-B
Q9, 11: 2SA934-Q or 2SB562-B
Q8, 13: 2SC1815-Y or 2SC945-P
Q10, 12: 2SC2060-Q or 2SD468-B
Q23: 2SA1015-Y 2SA733-P
Q24, 25: 2SC1815-Y or 2SC945-P
D1~7, 9~20, 22~75, 77, 80~88, 209~212, 214~221, 224~236: DS442
D302, 305: PR55355
D301, 303, 304, 306: PG55355Y
FUNCTION SWITCH P.C. BOARD 2/3
SENSING UNIT
S1: HSN-128
S1-1 EJECT
S2 FAS HSN-129
S1-2 NON REC
S1-3 NOR /C102
S1-4 HP SWITCH
REAR
FRONT
SOLENOID
SO
HXP-102
REEL MOTOR
RM
HXM-119
CAPSTAN MOTOR
CM
HXM-120
REC
+B Pause
EDT Out
PMS Pulse
PLAY
VDD
GND
CrO2
LOGIC UNIT
REC
PB
T.S
OFF
REC
PLAY
FF
REW
PAUSE

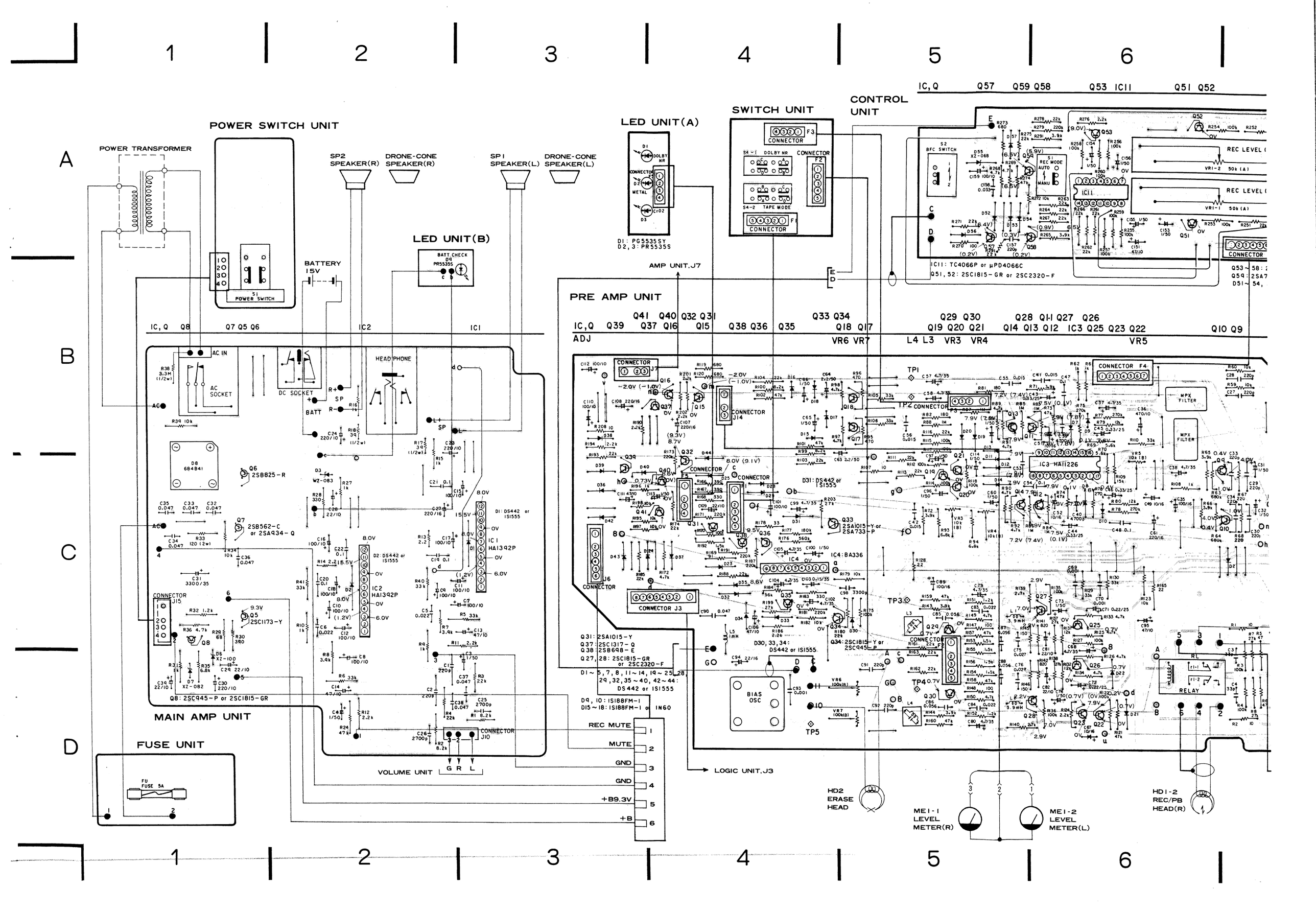
Fig. 56

8. CONNECTION DIAGRAM



IC1, 2, 4, 6: MSM4001RS IC3: MSM4027RS IC7: M54832P IC8: MSM4011RS
Q9, 11, 16: 2SA934-Q or 2SB562-B Q5: 2SC2209-P
Q6~8, 13, 15, 18~21, 24, 25, 201, 206, 207: 2SC1815-Y or 2SC945-P
Q10, 12: 2SC2060-Q or 2SD468-B Q17: 2SA715-B
Q14, 22, 23, 202~205: 2SA1015-Y or 2SA733-P D1~7, 9~20, 22~75, 77, 80~88, 209~212, 214~221, 224~236: DS442

Fig. 57


POWER SWITCH UNIT
POWER TRANSFORMER
SP2 SPEAKER(R)
DRONE-CONE SPEAKER(R)
SP1 SPEAKER(L)
DRONE-CONE SPEAKER(L)
LED UNIT(A)
LED UNIT(B)
SWITCH UNIT
CONTROL UNIT
BATTERY 15V
S1 POWER SWITCH
AMP UNIT.J7
PRE AMP UNIT
IC,Q Q8 Q7 Q5 Q6 IC2 IC1
IC,Q Q39 Q41 Q40 Q37 Q16 Q32 Q31 Q15 Q38 Q36 Q35 Q33 Q34 Q18 Q17 Q29 Q30 Q19 Q20 Q21 Q28 Q11 Q27 Q26 Q14 Q13 Q12 IC3 Q25 Q23 Q22 Q10 Q9
ADJ VR6 VR7 L4 L3 VR3 VR4 VR5
IC,Q Q57 Q59 Q58 Q53 IC11 Q51 Q52
AC IN
AC SOCKET
DC SOCKET
HEAD PHONE
CONNECTOR J7
CONNECTOR J14
CONNECTOR J6
CONNECTOR J3
CONNECTOR J15
CONNECTOR J10
CONNECTOR F4
CONNECTOR F3
CONNECTOR F2
CONNECTOR F1
TP1
TP2
TP3
TP4
TP5
IC3 HA11226
IC4 BA336
IC11 TC4066P or μPD4066C
Q51, 52: 2SC1815-GR or 2SC2320-F
Q53~58: 2SA733-P or 2SA1015-Y
Q59: 2SA733-P or 2SA1015-Y
D51~54, 57~60: 1S1555 or DS442
D1: PG5535SY
D2, 3: PR5535S
D8 6B4B41
Q6 2SB825-R
Q7 2SB562-C or 2SA934-Q
Q5 2SC1173-Y
Q8: 2SC945-P or 2SC1815-GR
Q31: 2SA1015-Y
Q37: 2SC1317-Q
Q38: 2SB698-E
Q27, 28: 2SC1815-GR or 2SC2320-F
D1~5, 7, 8, 11~14, 19~25, 28, 29, 32, 35~40, 42~44: DS442 or 1S1555
D9, 10: 1S188FM-1
D15~18: 1S188FM-1 or IN60
D30, 33, 34: DS442 or 1S1555
Q33: 2SA1015-Y or 2SA733-P
Q34: 2SC1815-Y or 2SC945-P
IC1 HA1392P
IC2 HA1392P
MAIN AMP UNIT
FUSE UNIT
FU FUSE 5A
VOLUME UNIT G R L
BIAS OSC
RELAY
MPX FILTER
REC MUTE
MUTE
GND
GND
+B9.3V
+B
LOGIC UNIT, J3
HD2 ERASE HEAD
ME1-1 LEVEL METER(R)
ME1-2 LEVEL METER(L)
HD1-2 REC/PB HEAD(R)
REC LEVEL (
VR1-2 50k (A)
VR1-1 50k (A)

7 8 9 10 11 12

Q56 Q54 Q55

REC LEVEL (R)

REC LEVEL (L)

CONNECTOR F4

CONNECTOR J4

Q53 ~ 58 : 2SC1815-Y or 2SC945-P
Q59 : 2SA733-P
D51 ~ 54, 56 ~ 58 : DS442 or IS1555

LOGIC UNIT, J4

MIC AMP UNIT

EXT MIC (L) J1

EXT MIC (R) J2

MIX LEVEL VR2 10k(A)

ECM2 R

ECM1 L

IC, Q Q101 IC31

Q101 2SC945-P or 2SC1815-Y

IC31 M51521L

LED UNIT(HWX-324)

TAPE PHONO/AUX AM FM AT

CONNECTOR J10

CONNECTOR J13

ST

Q1 ~ 7, 17 ~ 23, 29, 30, 35, 40, 41 : 2SC1815-Y or 2SC945-P
Q8, 11 ~ 14, 32, 36, 39 : 2SA1015-Y or 2SA733-P
Q9, 10 : 2SC2320L-F or 2SC732TM-GR
Q15, 16, 25, 26 : 2SD1012-F

IC2 : TC4066P or μPD4066C

IC1 M51521L

CONNECTOR J6

CONNECTOR J8

HD1-1 REC/PB HEAD(L)

SWITCH P.C.BOARD (HWX-370)

S2 FUNCTION SWITCH

S2-1 TAPE
S2-2 PHONO/AUX
S2-3 AM
S2-4 FM
S2-6 MUT
S2-5 FM MODE

S1 PHONO/AUX SWITCH

LINE OUT

PHONO/AUX

TUNER UNIT(HWE-157)

Q1 : 2SC1674-L
Q2 : 2SC1674-L or 2SC2786-L
Q3, 4, 8, 9 : 2SC1675-L or 2SC2787-L
Q6, 7 : 2SC380TM-O or 2SC461-B
Q5, 10 ~ 13 : 2SC945-P or 2SC1815-GR

D4, 7 : 1S188FM-1
D2, 3, 5, 6, 8, 10 : DS442
D9 : IS1555 or IS2076

ROD ANTENNA

EXT. ANTENNA TERMINAL

L3 BAR ANTENNA

BPF 1

IC3 M51204L

IC2 LA3361

IC1 LA1140

CONNECTOR J13

IC, Q	IC3	Q9	Q8	Q11	Q13	Q10	Q12	Q7	Q6	IC2	Q1	Q3	Q5	Q2	IC1	Q4
ADJ			T6			R11	T7	L3		TC1 ~ 4	T1	L3	VR2	T2	T3	VR1	T4	T5

Fig. 58

9. CABINET EXPLODED VIEW

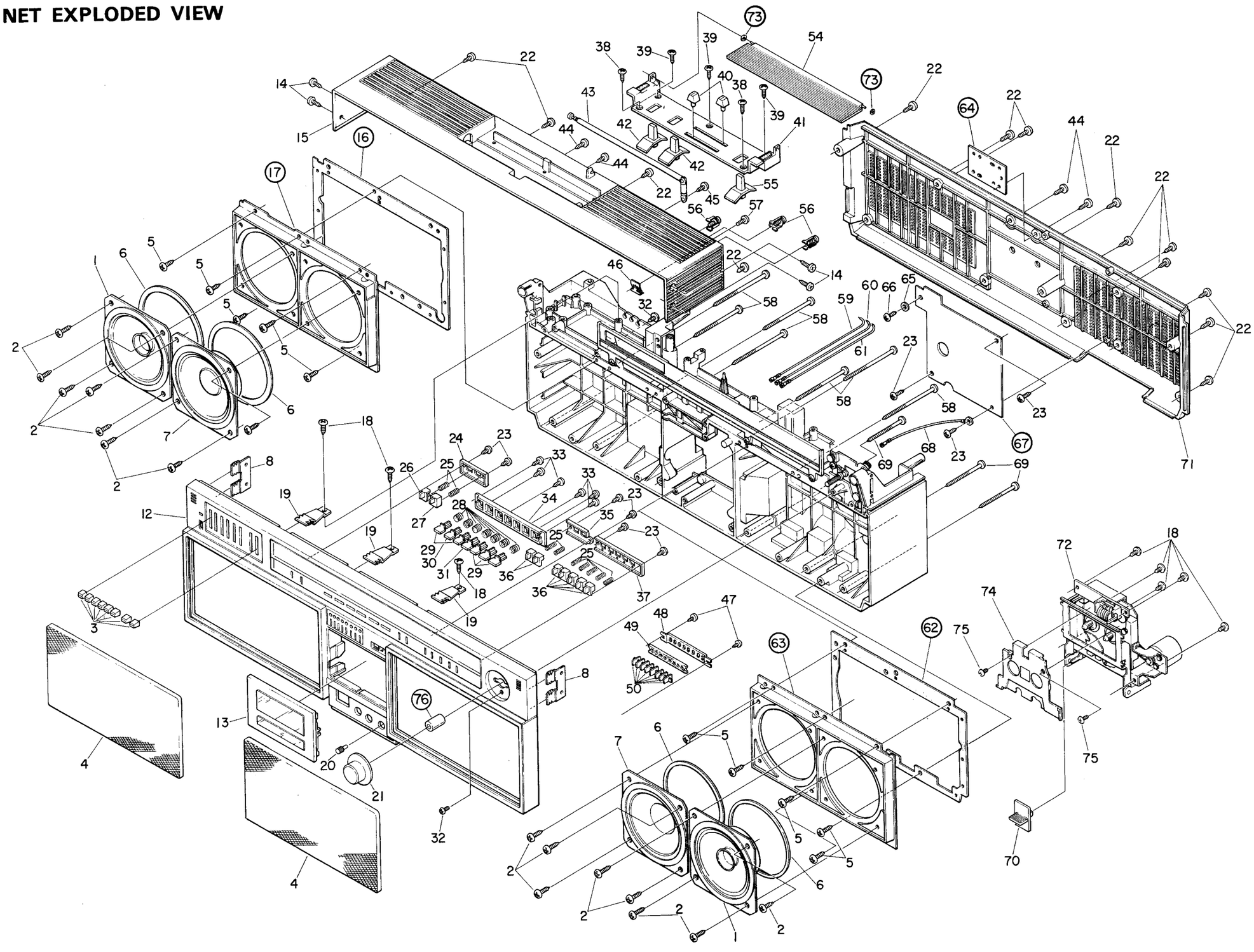


Fig. 59

• **Parts List**

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Mark	No.	Part No.	Description
★★	1.	HPV-117	Speaker
	2.	PNC40P120FZK	Screw
★	3.	HAC-230	Knob (VOLUME,EQUALIZER)
	4.	HNB-191	Net
	5.	PNC40P160FZK	Screw
	6.	HNM-331	SP Packing (SK-900/KU)
		HNM-267	SP Packing (SK-900/KC)
	7.	HPV-113	Drone Cone Speaker
	8.	HNC-619	Bracket
	9–11.	VACANT	
★	12.	HXA-836	Front Case Assy (SK-900/KU)
★		HXA-739	Front Case Assy (SK-900/KC)
★★	13.	HXA-729	Door Unit
	14.	HBA-138	Screw
★	15.	HNS-545	Top Case (SK-900/KU)
★		HNS-472	Top case (SK-900/KC)
	16.		Packing (L)
	17.		Baffle (L)
	18.	BNC30P100FMC	Screw
	19.	HNC-504	Bracket
★	20.	HAA-192	Knob (MIXING)
★	21.	HAA-191	Knob (TUNING)
	22.	PNC40P160FNi	Screw
	23.	BLZ30P080FMC	Screw
	24.	HNV-405	Holder (A)
	25.	HBH-311	Spring
★	26.	HAC-239	Knob (TAPE)
★	27.	HAC-240	Knob (DOLBY NR)
	28.	HBH-309	Spring
★	29.	HAC-225	Button (Silver)
★	30.	HAC-241	Button (REC)
★	31.	HAC-242	Button (PLAY)
	32.	BNC30P160FMC	Screw
	33.	BNC26P100FMC	Screw
	34.	HNV-388	Holder
	35.	HNV-408	Holder (C)
★	36.	HAC-228	Button (FUNCTION)
	37.	HNV-407	Holder (B)
	38.	BNC30P120FZK	Screw
	39.	PNZ30P080FZK	Screw
★	40.	HAC-232	Knob (REC VOL)
	41.	HXA-760	Support Panel Unit
★	42.	HAC-233	Knob (BFC,AUTO)
★★	43.	HDX-109	Antenna
	44.	BMZ30P080FZK	Screw
	45.	PNC40P120FNi	Screw
	46.	HNC-515	Antenna Terminal
	47.	PLZ26P060FMC	Screw
	48.	HNC-513	Holder
	49.	HNM-329	Cushion (SK-900/KU)
		HNM-311	Cushion (SK-900/KC)
★	50.	HAC-244	Button
	51–53.	VACANT	
	54.	HXA-736	Cover Unit
★	55.	HAC-231	Knob (TIMER)
	56.	HNC-123	Terminal
	57.	PMZ30P080FBK	Screw
	58.	HBA-130	Screw
	59.	HDE-206	Connector (Blue)
	60.	HDE-183	Connector (Red)
	61.	HDE-184	Connector (Black)
	62.		Packing (R)
	63.		Baffle (R)
	64.		Plate
	65.	WC30FMC	Washer
	66.	BMZ30M030FMC	Screw
	67.		Shield
	68.	HDE-207	Connector
	69.	HBA-137	Screw
★	70.	HAC-234	Knob (EJECT)
★	71.	HNS-548	Rear Case (SK-900/KU)
★		HNS-473	Rear Case (SK-900/KC)
	72.	HXA-880	Cassette Mechanism Assy
	73.		Washer
	74.		Cover
	75.	BMZ26P080FNi	Screw
	76.		Collar

10. CHASSIS(1) EXPLODED VIEW

• **Parts List**

Mark	No.	Part No.	Description
	1.	BNC30P100FMC	Screw
	2.	VACANT	
	3.		MS Switch Unit
	4.	BNC30P080FMC	Screw
	5.		LED Guide
	6.		Bracket
★	7.	HAW-132	Meter
	8.	HXA-841	Back Plate Unit
	9.	PNC26P140FMC	Screw
	10.	PNC20P060FMC	Screw
	11.		LED Guide
	12.	HDE-201	Connector (4P)
	13.		LED Unit (A)
	14.	BNC30P060FMC	Screw
	15.	HDE-212	Connector
	16.	HAF-113	Pointer
	17.	BMZ30P060FMC	Screw
	18.		Switch Unit
	19.	HDE-200	Connector (5P)
	20.	HDE-202	Connector (5P)
	21.	HDE-199	Connector (4P)
	22.	HNV-404	Holder
★	23.	HPM-124	Microphone Unit
	24.		Function Switch P.C. Board
	25.		LED Guide
	26.		LED Guide
	27.	VACANT	
	28.	HDE-209	Connector (6P)
	29.	HDE-210	Connector (6P)
	30.	HWX-324	LED Unit
	31.	BNC30P120FMC	Screw
	32.	HNV-399	Bracket (C)
	33.		Clamper
	34.		Mount Plate
	35.	HKN-132	Jack (MIC L)
	36.	HKN-133	Jack (MIC R)
	37.		Bracket
	38.		Washer
	39.		Nut
	40.		Earth Plate
	41.	HDE-179	Connector (7P)
	42.		Mic Amp Unit
	43.	HXA-777	Pulley Assy
	44.	HNV-396	Bracket (A)
	45.	HNV-397	Bracket (B)
	46.	HNS-465	Handle Grip
	47.	CMZ30P100FNi	Screw
	48.	HNR-151	Handle
	49.	HNV-379	Bush
	50.	WW60FBK	Washer
	51.	YE30FMC	Washer
	52.	HNC-510	Holder (L)
	53.	HNC-511	Holder (R)
	54.	HLA-285	Shaft
	55.	YS30FBK	Washer
	56.	HBF-151	Washer
	57.	HNV-151	Pulley
★	58.	HPM-125	Microphone Unit
	59.		Bracket
	60.	HXA-776	Pulley Assy
	61.	BMZ30P040FMC	Screw
	62.	PMZ40P250FMC	Screw
	63.		Bracket
	64.	HBA-140	Screw
	65.		Bracket
	66.	HXA-847	Tuning Assy
	67.	HXA-734	Handle Assy
	68.	HBA-139	Screw

Assembly	Exploded View	Key No.	Unit
Amp Assy (HWX-367)	Chassis (1)	13	LED Unit (A)
	Chassis (1)	18	Switch Unit
	Chassis (1)	42	Mic Amp Unit
	Chassis (2)	49	Control Unit
	Chassis (2)	73	Pre Amp Unit
Equalizer Amp Assy (HWG-119)	Chassis (2)	17	Volume Unit
	Chassis (2)	37	Amp Unit
Logic Assy (HWX-369)	Chassis (1)	3	MS Switch Unit
	Chassis (1)	24	Function Switch P.C.Board
	Chassis (2)	63	Logic Unit

- Chassis (1)

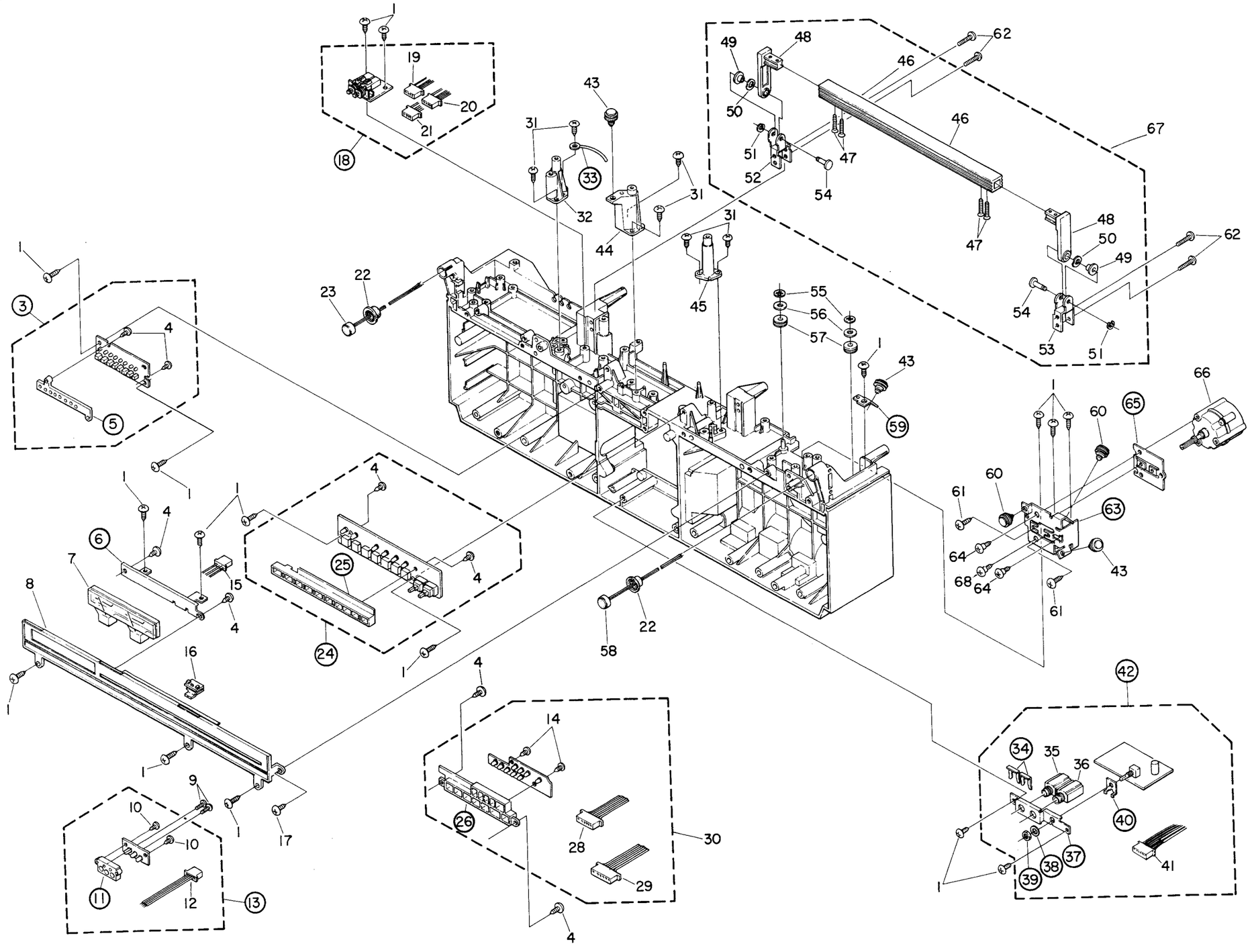


Fig. 60

11. CHASSIS(2) EXPLODED VIEW

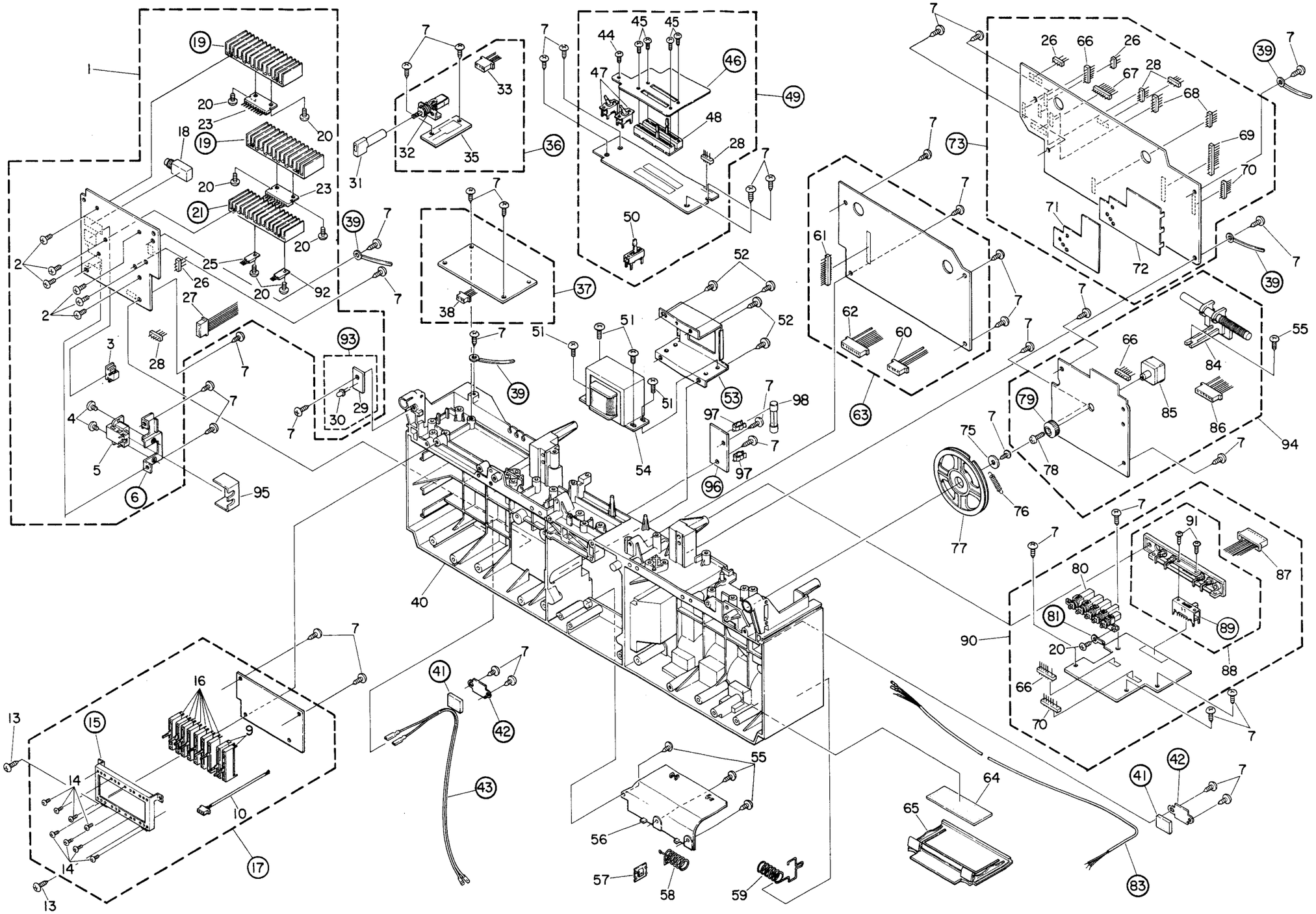


Fig. 61

• Parts List

Mark	No.	Part No.	Descrption
	1.	HWH-117	Main Amp Assy
	2.	BNC30P080FMC	Screw
	3.	HKP-108	Socket
	4.	BMZ26P060FMC	Screw
⚠	5.	HKP-107	Socket
	6.		Bracket
	7.	BNC30P100FMC	Screw
	8.	VACANT	
★	9.	HCS-139	Volume, 20kΩ (A)
	10.	HDE-177	Connector (3P)
	11,12.	VACANT	
	13.	HBA-139	Screw
	14.	PMZ20P040FMC	Screw
	15.		Bracket
★	16.	HCS-140	Volume, 20kΩ(W) (EQUALIZER)
	17.		Volume Unit
	18.	HKN-131	Jack
	19.		Heat Sink
	20.	BMZ30P060FMC	Screw
	21.		Heat Sink
	22.	VACANT	
★★	23.	HA1392P	IC
	24.	VACANT	
★★	25.	2SB825	Transistor
	26.	CKS-033	Plug (3P)
	27.	HDE-175	Connector (6P)
	28.	CKS-032	Plug (4P)
	29.		P.C.Board
★	30.	PR5535S	LED
★	31.	HAC-243	Button (POWER)
★★	32.	HSG-143	Switch (POWER)
	33.	HDE-197	Connector (4P)
	34.	VACANT	
	35.	HNP-337	P.C. Board
	36.		Power Switch Unit
	37.		Amp Unit
	38.	HDE-178	Connector (3P)
	39.		Clamper
	40.	HNS-544	Speaker Case (SK-900/KU)
		HNS-471	Speaker Case (SK-900/KC)
	41.		Bush
	42.		Plate
	43.		Connector
	44.	BMZ26P040FMC	Screw
	45.	BMZ30P040FMC	Screw
	46.		Shield
★★	47.	HSK-119	Switch (BFC,REC MODE)
★	48.	HCS-142	Volume, 50kΩ (A)(REC)
	49.		Control Unit
★★	50.	HSH-118	Switch (TIMER)

Mark	No.	Part No.	Description
	51.	BMZ40P060FMC	Screw
	52.	PNC40P100FMC	Screw
	53.		Bracket
⚠ ★	54.	HTT-165	Power Transformer (SK-900/KU) 120V AC
⚠ ★		HTT-160	Power Transformer (SK-900/KC) 120V AC
	55.	BNC30P120FMC	Screw
	56.	HNV-398	Battery Housing
	57.	HNC-506	Terminal
	58.	HBH-299	Spring
	59.	HBH-300	Spring
	60.	HDE-180	Connector (4P)
	61.	HKS-131	Plug
	62.	HDE-181	Connector (8P)
	63.		Logic Unit
	64.	HNM-257	Cushion
★★	65.	HNS-466	Cover
	66.	CKS-018	Plug (6P)
	67.	CKS-063	Plug (8P)
	68.	CKS-050	Plug (5P)
	69.	HKS-130	Plug (11P)
	70.	HKS-126	Plug (7P)
	71.	HNM-330	Shield
	72.	HNC-549	Shield
	73.		Pre Amp Unit
	74.	VACANT	
	75.	HNC-507	Washer
	76.	HBH-313	Spring
	77.	HNV-387	Dial Pulley
	78.	BMZ26P060FMC	Screw
	79.		Bush
★★	80.	HSG-136	Switch
	81.		Lug
	82.	VACANT	
	83.		Connector
	84.	HTX-137	Antenna Unit
	85.	HCL-110	Variable Capacitor
	86.	HDE-203	Connector (7P)
	87.	HDE-182	Connector (11P)
	88.	HKN-134	Jack Assy
	89.		Switch (PHONO/AUX)
	90.	HWX-370	Switch P.C. Board
	91.		Screw
★★	92.	2SC1173	Transistor
	93.		LED Unit (B)
	94.	HWE-157	Tuner Unit
	95.	CNV-863	AC Cap
	96.		P.C.Board
	97.	HKR-103	Fuse Holder
⚠ ★★	98.	HEK-116	Fuse, 5A

12. CASSETTE MECHANISM EXPLODED VIEW (TOP)

• Parts List

Mark	No.	Part No.	Description
	1.	BMZ20P100FMC	Screw
★	2.	HPB-110	Head (Erase)
	3.	HDE-189	Connector
	4.	HDE-188	Connector (Red)
	5.	HDE-187	Connector (White)
★★	6.	HPB-116	Head (R/P)
	7.	CBH-475	Spring
	8.		Base
	9.	HBH-291	Spring
	10.	YE30FUC	Washer
	11.	HBH-297	Spring
	12.		Bracket
	13.		Spring
	14.		Holder
	15.	BMZ26P060FMC	Screw
	16.		Holder
	17.	YE15FUC	Washer
	18.	HBH-295	Spring
	19.		Lever
	20.		Head Plate Unit
	21.		Lever Unit
	22.	HNV-373	Gear
	23.	YE20FUC	Washer
	24.		Arm
	25.		Collar
	26.	CBH-497	Spring
	27.		Arm
	28.		Collar
	29.	HXA-727	Damper Unit
★★	30.	HXM-119	Motor (Reel)
	31.	BMZ26P040FMC	Screw
	32.		Bracket
	33.	PMS26P025FUC	Screw
★★	34.	HNT-130	Belt (F.F,REW)
	35.		Bracket Unit
	36.	HBF-145	Washer
★★	37.	HXA-489	Reel Unit
	38.	HBF-115	Washer
	39.		Bracket Unit
	40.		Holder
	41.		Arm
	42.		Arm
	43.		Collar
	44.		Arm
	45.	HBH-291	Spring
	46.		Pulley
	47.		Roller
	48.	YE12FUC	Washer
	49.		Chassis Unit
	50.		Lever
	51.	HBH-293	Spring
★★	52.	HXA-775	Roller Unit
	53.	HBH-288	Spring
	54.		Lever
	55.		Cover
	56.	HAW-131	Counter
	57.		Bracket
	58.	BRZ26P080FMC	Screw
	59.	HBA-126	Screw
	60.		Bracket
	61.	CNV-840	Cushion
	62.	HXA-679	Pulley Unit
	63.	ZMK26M030FMC	Screw
★★	64.	HXM-120	Motor (Capstan)

- Cassette Mechanism (Top)

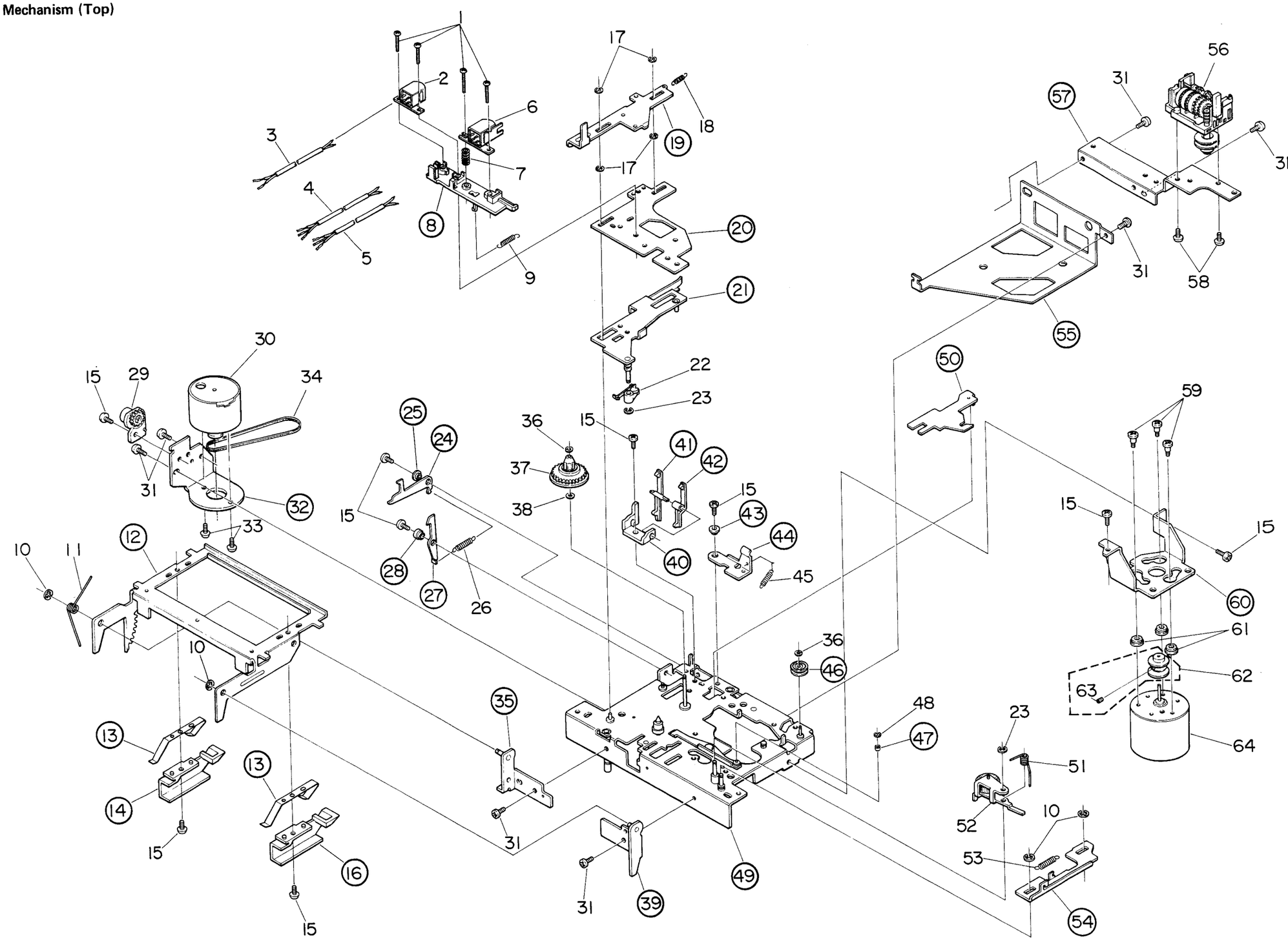


Fig. 62

13. CASSETTE MECHANISM EXPLODED VIEW (BOTTOM)

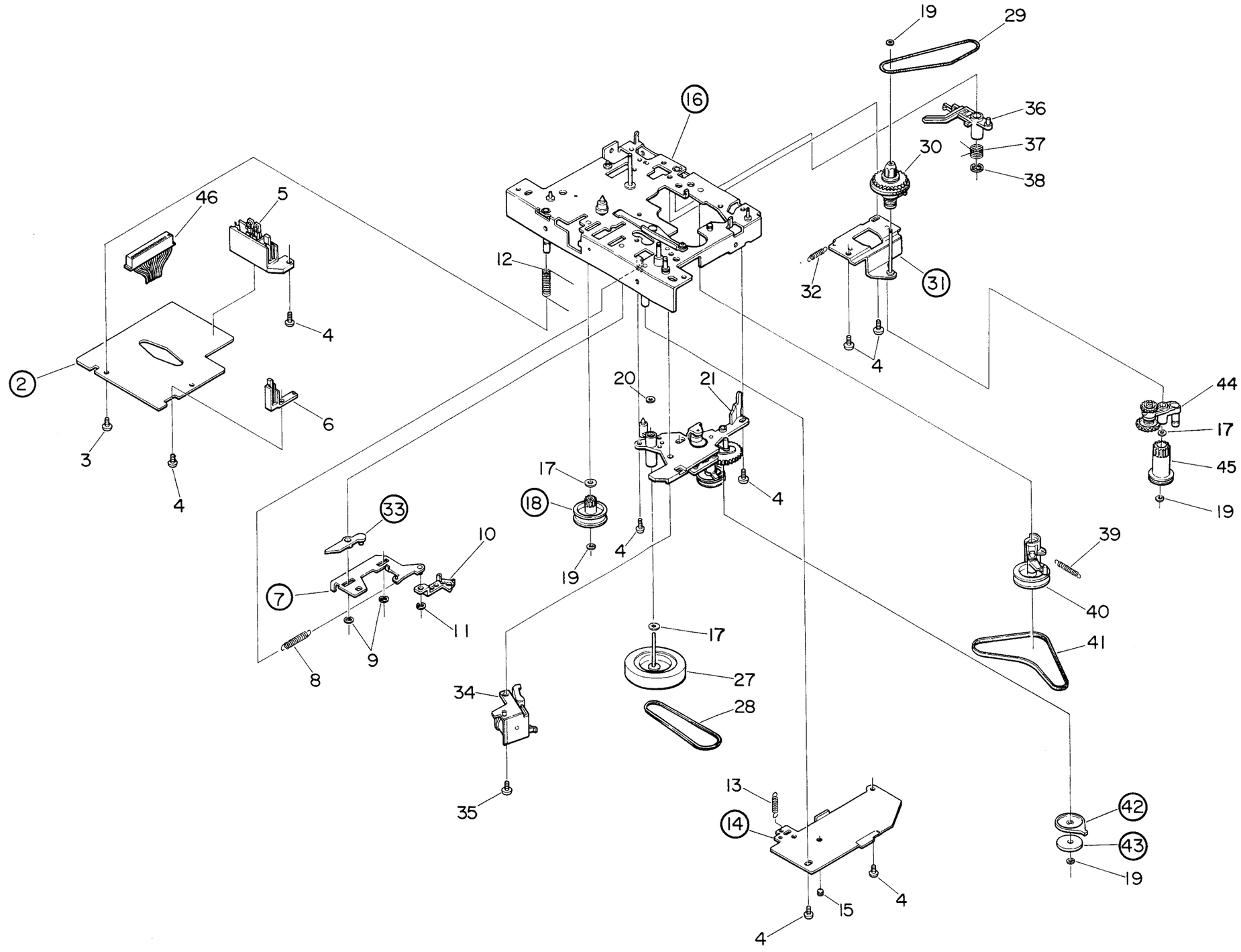


Fig. 63

• Parts List

Cassette Mechanism (Bottom)

Mark	No.	Part No.	Description
	1.	VACANT	
	2.		P.C.Board
	3.	CBA-076	Screw
	4.	BMZ26P060FMC	Screw
★★	5.	HSN-128	Switch
★★	6.	HSN-129	Switch (FAS)
	7.		Lever Unit
	8.	HBH-290	Spring
	9.	YE20FUC	Washer
	10.	HNV-231	Lever
	11.	YE25FUC	Washer
	12.	HBH-296	Spring
	13.	HBH-292	Spring
	14.		Plate
	15.	CNV-833	Screw
	16.		Chassis Unit
	17.	HBF-148	Washer
	18.		Pulley
	19.	HBF-145	Washer
	20.	HBF-147	Washer
	21.	HXA-492	Base Unit
	22–26.	VACANT	
	27.	HNR-146	Flywheel
★★	28.	CNT-068	Belt
★★	29.	HNT-131	Belt (Counter)
★★	30.	HXA-488	Reel Unit
	31.		Bracket Unit
	32.	HBH-289	Spring
	33.		Arm
	34.	HXP-102	Solenoid
	35.	BMZ26P080FMC	Screw
	36.	HNV-364	Arm
	37.	HBH-294	Spring
	38.	YE40FUC	Washer
	39.	CBH-485	Spring
	40.	HXA-495	TP Unit
★★	41.	HNT-132	Belt
	42.		Holder
	43.		Weight
	44.	HXA-718	Gear Unit
	45.	HNV-369	Pulley
	46.	HDE-211	Connector

14. PACKING METHOD

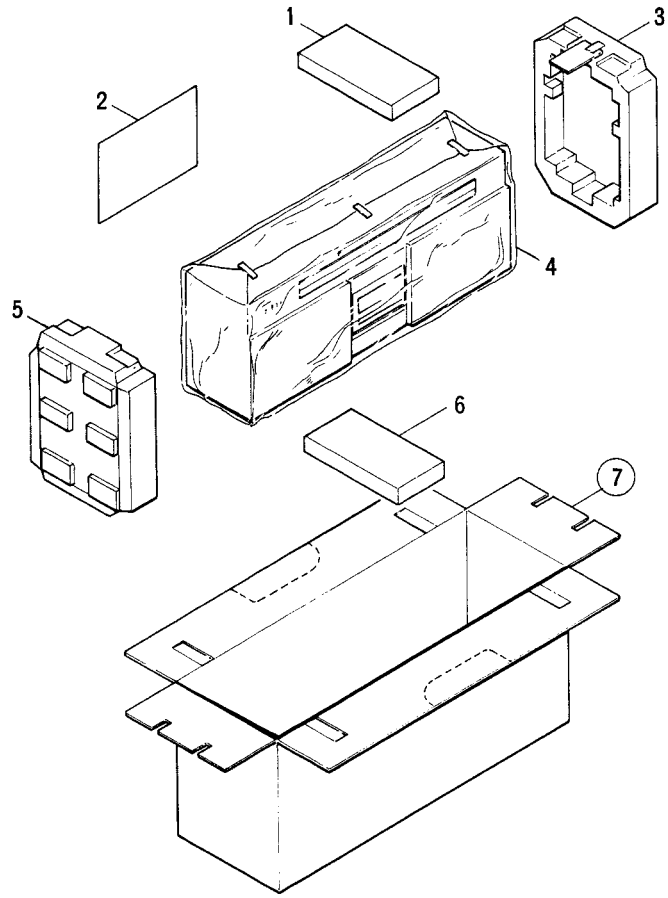


Fig. 64

• Parts List

Mark	No.	Part No.	Description
	1.	HHA-620	Styrofoam
	2-1.	HRB-171	Owner's Manual (English)
	2-2.	HRB-172	Owner's Manual (French) (SK-900/KC)
⚠	2-3.	CDG-029	AC Cord
	3.	HHA-514	Styrofoam
	4.	HEG-144	Cover
	5.	HHA-513	Styrofoam
	6.	HHA-621	Styrofoam
	7.		Carton (SK-900/KU) Carton (SK-900/KC)

15. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10^1*	*561 . . . . . .*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10^3*	*473 . . . . . .*	*RD1/4PS 4 7 3 J*
0.5Ω	*OR5 . . . . . .*		*RN2H 0 R 5 K*
1Ω	*010 . . . . . .*		*RS1P 0 1 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10^1 . . . . . RN1/4SR 5 6 2 1 F

- *For your parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Main Amp Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	HA1392P	IC1,IC2
★★	2SC1173-Y	Q5
★★	2SB825	Q6
★★	2SA934 or 2SB562-C	Q7
★★	2SC1815 or 2SC945	Q8
★	DS442 or 1S1555	D1,D2
★	WZ-083	D3
	VACANT	D4,D5
★	XZ-100	D6
★	XZ-082	D7
★	6B4B41	D8
★	PR5535S	D9

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1–R12, R15, R16, R24, R27, R29, R31, R32, R34–R36, R39–R41
	RD¼VS □□□J	R13,R14,R28,R30
	RD½PS □□□J	R17,R18,R38
	RS2P □□□K	R33
	VACANT	R19–R23,R25,R26,R37

CAPACITORS

Mark	Part No.	Symbol & Description	
	CKPYB 221K 50	C1,C2	
	CEA 010M 50L	C3,C4	
	CQMA 223M 50	C5,C6	
	CEA 101M 10L	C7–C12,C15–C18	
	CEA 470M 10L	C13,C14	
	CQMA 104M 50	C19–C22	
	CEA 221M 10L	C23,C24,C30	
	CQMA 272K 50	C25,C26	
	CEA 221M 16L	C27	
	CEA 220M 10L	C28,C29, C39	
	CCH-070 or HCH-118	C31	3300μF/35V
	CKDYF 473Z 25	C32–C36	
	CQMA 473K 50	C37,C38	

LED Unit (B)

Mark	Part No.	Symbol & Description	
★	PR 5535S	D9	LED

Power Switch Unit

Mark	Part No.	Symbol & Description	
★★	HSG-143	S1	Switch (POWER)

Fuse Unit

Mark	Part No.	Symbol & Description
⚠ ★★	HEK-116	Fuse, 5A

Volume Unit

Mark	Part No.	Symbol & Description	
★	HCS-139	VR1,VR2	Volume, 20kΩ(A) (MAIN)
★	HCS-140	VR3–VR8	Volume, 20kΩ (W) (EQ)

Amp Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	TA7558P or μPC4558C or NJM4558DD	IC1
★★	TA75902P	IC2
★★	NJM2902N or TA75902P	IC3,IC4

RESISTORS

Mark	Part No.	Symbol & Description	
	RD¼PM □□□J	R1–R12,R15–R54	
	HCN-106	R55	33Ω
	VACANT	R13,R14	

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 4R7M 35L	C1,C2
	CCDSL 101K 50	C3,C4
	CEA 010M 50L	C5,C6
	CQMA 683K 50	C7,C8
	CSZA R68M 35	C9,C10
	CQMA 153K 50	C11,C12
	CSZA R47M 35	C13,C14
	CQMA 822K 50	C15,C16
	CSZA R22M 35	C17,C18
	CQMA 272K 50	C19,C20
	CSZA R15M 35	C21,C22
	CQMA 102K 50	C23,C24
	CQMA 333K 50	C25,C26
	CKDYB 331K 50	C27,C28
	CQMA 103K 50	C29,C30
	CEA 470M 10L	C31
	CEA 101M 10L	C32
	CKDYB 181K 50	C33–C36

Mic Amp Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description	
★★	M51521L	IC31	
★★	2SC945 or 2SC1815	Q101	
★	HCS-141	VR2	Volume, 10kΩ(A) (MIXING)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R301–R318

CAPACITORS

Mark	Part No.	Symbol & Description
	CSYAR 33M 25SAN	C201,C202
	CQMA 153K 50	C203,C204
	CEA 4R7M 35L	C205
	CEA 101M 16L	C206
	CKPYB 102K 50	C207,C208
	CEA 010M 50L	C209,C210,C217,C218
	CKDYB 221K 50	C211,C212
	CEA 220M 10L	C213,C214
	CKPYB 221K 50	C215,C216

Pre Amp Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	M51521L	IC1
★★	TC4066P or μPD4066C	IC2
★★	HA11226	IC3
★★	BA336	IC4
★★	2SC1815 or 2SC945	Q1–Q7, Q17–Q23, Q29, Q30, Q34, Q35,Q40,Q41
★★	2SA1015 or 2SA733	Q8,Q11–Q14,Q32,Q33,Q36,Q39
★★	2SC732TM-GR or 2SC2320L-F	Q9,Q10
★★	2SD1012	Q15,Q16,Q25,Q26
	VACANT	Q24
★★	2SC1815-GR or 2SC2320-F	Q27,Q28
★★	2SA1015	Q31
★★	2SC1317	Q37
★★	2SB698	Q38
★	DS442 or 1S1555	D1–D5, D7, D8, D11–D14, D19–D25, D28–D40, D42–D44
	VACANT	D6,D26,D27,D41
★	1S188FM-1 or 1S34	D9,D10
★	1S188FM-1 or 1N60	D15–D18

Mark	Part No.	Symbol & Description	
	HTH-122	L1,L2	Coil, 3.9mH
	HTF-112	L3,L4	Coil
	HTF-117	L5	Coil, 1mH
★	CCP-037	VR1–VR5	Semi-fixed, 10kΩ(B)
★	HCP-111	VR6,VR7	Semi-fixed,100kΩ(B)
	HSR-101	RL	Relay
	HTX-126	OSC	
	HTX-120	MPX Filter	

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1–R106, R108–R127, R129–R163, R166–R177, R179–R188, R190–R207
	HCN-103	R107,R208 10Ω
	HCN-105	R128,R165 22Ω
	HCN-106	R178 33Ω
	VACANT	R164,R189

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 2R2M 50L	C1,C2,C63,C64
	CCDSL 330J 50	C3,C4
	CKPYB 221K 50	C5,C6,C27–C30,C33,C34,C91,C92
	CEA 221M 6L	C7,C8
	CQMA 223K 50	C9,C10,C83,C84
	CQMA 333K 50	C11,C12
	CEA 010M 50L	C13, C14, C26, C31, C32, C59, C60, C65, C66, C73, C74, C96, C97, C100, C113,C114
	CEA 101M 16L	C15,C35,C89
	CEA 470M 10L	C16, C95, C106, C111
	CQMA 273K 50	C17,C18,C75,C76
	CEA 4R7M 35L	C19–C24, C37, C38, C57, C58, C68, C79, C80, C99, C102, C104, C105
	CEA 101M 10L	C25,C101,C110,C112
	CEA 471M 10L	C36
	CQMA 472J 50	C39,C40
	CQMA 153J 50	C41,C42,C55,C56
	CSYA R33M 16 or CSZA R33M 35	C43–C46
	CQMA 104K 50	C47,C48,C53,C54
	CEA 100M 16L	C49,C51,C52
	VACANT	C50,C62
	CEA 221M 16L	C61,C107,C108
	CEA 4R7M 35L	C67
	CQMA 102K 50	C69,C70
	CSYAR 22M 25SAN or CSYAR 22M 35	C71,C72
	VACANT	C77,C78
	CEA 220M 10L	C81,C82,C109
	CQMA 563K 50	C85–C88
	CQMA 473K 50	C90
	CKPYB 102K 50	C93
	CEANL 220M 16LL	C94
	CQMA 332K 50	C98
	CSYAR15M25SAN	C103
	VACANT	C115,C116
	CKDYD 103M 50	C117,C118

Control Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description	
★★	TC4066P or μPD4066C	IC11	
★★	2SC2320-F	Q51,Q52	
★★	2SC1815 or 2SC945	Q53–Q58	
★★	2SA733	Q59	
★	DS442 or 1S1555	D51–D54,D56–D58	
★	XZ-068	D55	
★	HCS-142	VR1	Volume, 50kΩ(A) (REC)
★★	HSK-119	S1,S2	Switch (REC MODE,BFC)
★★	HSH-118	S3	Switch (TIMER)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R251–R289,R291
	HCN-106	R290 33Ω

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 470M 10L	C151,C161
	VACANT	C152
	CEA 010M 50L	C153–C156
	CKDYB 221K 50	C157
	CQMA 333K 50	C158
	CEA 101M 10L	C159
	CEA 100M 16L	C160
	CEA 4R7M 35L	C162
	CSYAR 22M 25SAN	C163
	CEA 220M 10L	C164

Switch Unit

Mark	Part No.	Symbol & Description
★★	HSG-132	S4 Switch (DOLBY NR, TAPE MODE)

LED Unit (A)

Mark	Part No.	Symbol & Description
★	PG5535SY	D1 LED (DOLBY NR)
★	PR5535S	D2,D3 LED (CrO_2, METAL)

Function Switch P.C.Board

Mark	Part No.	Symbol & Description
★	DS442	D213
★	PG5535SY	D301, D303, D304, D306–D308 LED (PLAY, FF, REW, PAUSE,OR,MR)
★	PR5535S	D302,D305 LED (REC,EDITOR)
★★	HSG-133	S1–S7 Switch (EDITOR, REC, STOP, PLAY, REW, FF,PAUSE)
★★	HSG-134	S8,S9 Switch (OR,MR)
	RD¼PM □□□J	R20–R22

MS Switch Unit

Mark	Part No.	Symbol & Description
★	DS442	D201–D208
★	GL3PR2	D301–D308 LED
★★	HSG-135	S1–S8 Switch (MS)

Logic Unit

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	MSM4001RS	IC1,IC2,IC4,IC6
★★	MSM4027RS	IC3
	VACANT	IC5
★★	M54832P	IC7
★★	MSM4011RS	IC8
★★	2SC2209	Q5
★★	2SC1815 or 2SC945	Q6–Q8, Q13, Q15, Q18–Q21, Q24, Q25,Q201,Q206,Q207
★★	2SA934 or 2SB562	Q9,Q11,Q16
★★	2SC2060 or 2SD468	Q10,Q12
★★	2SA1015 or 2SA733	Q14, Q22, Q23, Q202–Q205
★★	2SA715	Q17
★	WZ-083	ZD4,ZD5,ZD8
★	XZ-057	ZD201,ZD204
★	DS442	D1–D7, D9–D20, D22–D75, D77, D80–D88, D209–D212, D214–D221,D224–D236
	VACANT	D8, D21, D76, D78, D79, D213 D222,D223

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1–R7, R14–R19, R24, R26–R46, R48–R65, R67–R90, R92–R104, R106–R116, R201–R215, R217–R242
	HCN-109	R47 10Ω
	HCN-103	R66 10Ω
	VACANT	R8–R13, R20–R23, R25, R91, R105,R117–R200,R216

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 103K 50	C6, C7, C23, C33, C35, C37, C201, C202,C207,C211,C214,C215
	CSYA R47M 16 or CSZA R47M 35	C8,C21
	CCDSL 101K 50	C9, C10, C14, C15, C26, C27, C29–C32,C209
	CEA 100M 16L	C11,C45
	CEA 330M 16L	C12
	CEA 470M 25L	C13
	CKDYB 221K 50	C16
	VACANT	C17–C20,C24,C28,C36,C42
	CEA 010M 50L	C22,C25,C212,C213
	CQMA 103K 50	C34
	CKDYB 102K 50	C38,C39,C206
	CSYA R33M 16 or CSZA R33M 35	C40,C43,C44
	CKDYB 331K 50	C41,C204
	CSYA R68M 16 or CSZA R68M 35	C203
	CKDYB 472K 50	C205
	CEA 2R2M 25NP	C208,C210

Tuner Unit (HWE-157)

MISCELLANEOUS

Mark	Part No.	Symbol & Description
★★	LA1140	IC1
★★	LA3361	IC2
★★	M51204L	IC3
★★	2SC1674-L	Q1
★★	2SC2786-L or 2SC1674-L	Q2
★★	2SC1675-L or 2SC2787-L	Q3,Q8,Q9
★★	2SC1675 or 2SC2787-L	Q4
★★	2SC1815-GR or 2SC945-P	Q5,Q10–Q13
★★	2SC461-B or 2SC380TM-O	Q6,Q7
	VACANT	D1
★	DS442	D2,D3,D5,D6,D8,D10
★	1S188FM-1	D4,D7
★	1S1555 or 1S2076	D9
	CTH-038	L1 Coil, 2.2μH

Mark	Part No.	Symbol & Description	
	VACANT	L2	
	HTX-137	L3	Antenna Unit
	CTC-061	T1	Coil
	HTC-135	T2	Coil
	CTC-028 or CTC-040	T3	IF Transformer
	CTC-122	T4	Coil
	CTC-123	T5	Coil
	HTE-102 or HTE-103	T6	IF Transformer
	CTB-031 or CTB-037	T7	Coil
	CTE-038 or CTE-084	T8	IF Transformer
	HCL-110	TC1–TC4,VC1–VC4	Variable Capacitor
	HWW-106	BPF1	Filter
	CTF-038	CF1,CF2	Ceramic Filter
★	CCP-037	VR1,VR2	Volume, 10kΩ(B)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1–R4,R6–R10, R12–R15, R17, R18, R20–R22, R24–R31, R33–R75
	RD¼VM □□□J	R11,R16,R23
	VACANT	R5,R19,R32

CAPACITORS

Mark	Part No.	Symbol & Description
	CCPRH 270J 50	C1
	CKPYX 103N 25	C2, C8, C15, C17, C46, C52, C58–C60
	CCDSH 220J 50	C3
	CCPSL 3R3K 50	C4
	CCPSL 010M 50	C5
	CCPRH 100J 50	C6,C12
	CCPSL 101J 50	C7,C47
	VACANT	C9,C10
	CCDCH 240J 50	C11
	CCPRH 180J 50	C13,C51
	CCPRH 330J 50	C14,C30
	VACANT	C16
	CKPYY 223N 16	C18, C19, C29, C45, C49, C50, C54, C65
	CKDYF 473Z 25	C20,C21,C23,C27,C66
	CEA 4R7M 25L	C22,C26
	CEA 470M 10L	C24,C32
	CCDSL 330K 50	C25
	CEA 2R2M 50L	C28
	CEA 010M 50L	C31,C34,C35,C38,C42,C62
	CQMA 473K 50	C33
	CQMA 223K 50	C36,C37
	CQSH 102J 50	C39
	CEA R47M 50L	C40,C41
	CEA 100M 16L	C43,C57,C64
	CCDSH 020D 50	C44
	CKDYF 403Z 25	C48,C55
	CCPUJ 8R2K 50	C53
	CKDYB 101K 50	C56
	CQMA 333K 50	C61
	CSZA 0R1M 25 or CSYA 0R1M 16	C63
	CKDYB 681K 50	C67

LED Unit (HWX-324)

Mark	Part No.	Symbol & Description	
★	MV-11	D1,D5	
★	PR5535S	D2,D4,D6,D8–D11	LED (▶,◀, ST,PHONO/AUX, AM,FM,AT)
★	PG5535SY	D3,D7	LED (■ ,TAPE)
	RD¼PM □□□J	R1	

Switch P.C. Board (HWX-370)

MISCELLANEOUS

Mark	Part No.	Symbol & Description	
★★	M51521L	IC1	
★	DS442	D1	
		S1	Switch (PHONO/AUX)
★★	HSG-136	S2	Switch (FUNCTION)

RESISTORS

Mark	Part No.	Symbol & Description	
	RD¼PM □□□J	R1–R32	
	HCN-104	R33	2.2Ω

CAPACITORS

Mark	Part No.	Symbol & Description
	CSYA R22M 16 or CSZA R22M 35	C1,C2
	CKPYB 221K 50	C3,C4
	CEA 101M 10L	C5,C6,C13
	CQMA 473K 50	C7,C8
	CEA 010M 50L	C9,C10
	CQMA 822K 50	C11,C12
	CEA 100M 16L	C14
	CKDBC 823M 25	C15

Sensing Unit

Mark	Part No.	Symbol & Description	
★	SIB01-02 or 1S1886	D1	
★★	HTH-121	L1,L2	Coil
★★	HSN-128	S1	Switch (EJECT,NON REC,NOR/ CrO_2, H.P)
★★	HSN-129	S2	Switch (FAS)
	RD¼PM □□□J	R1	
	CEA 100M 16NP	C1	
	CEA 101M 16L	C2,C5	
	CEA 470M 16NP	C3,C4	
	CEA 102M 16L	C6	

Miscellaneous Parts List

Mark	Part No.	Symbol & Description	
★★	HPV-117	SP	Speaker
⚠ ★	HTT-165	T	Power Transformer (SK-900/KU)
⚠ ★	HTT-160	T	Power Transformer (SK-900/KC)
★	HPM-124	ECM1	Microphone Unit (L)
★	HPM-125	ECM2	Microphone Unit (R)
★★	HPB-116	HD1	Head (R/P)
★	HPB-110	HD2	Head (ERASE)
	HXP-102	SO	Solenoid
★★	HXM-120	CM	Motor (Capstan)
★★	HXM-119	RM	Motor (Reel)
★	HAW-132	ME1	Meter